DOE/EIA-0340(87)/1

987)v.1

Energy Information Administration

Petroleum Supply Annual 1987

Volume 1

READEX FICHE best copy available

E 3.11/5-5:

This publication is available from the Superintendent of Documents, U.S. Government Printing Office (GPO). Ordering information and purchase of this and other Energy Information Administration (EIA) publications may be obtained from the GPO or the EIA's National Energy Information Center (NEIC). Questions on energy statistics should be directed to the NEIC. Addresses and telephone numbers appear below.

National Energy Information Center, EI-231
Energy Information Administration
Forrestal Building
Room 1F-048
Washington, DC 20585
(202)586-8800

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
(202)783-3238

We thank the following for the use of their photographs in this report.

Champlin Petroleum Co., page ix (courtesy of American Petroleum Institute)
Standard Oil Co., page 1 (courtesy of American Petroleum Institute)
Unnamed Refinery, page 61 (courtesy of American Petroleum Institute)
PPG Industries, Inc., page 111 (courtesy of American Petroleum Institute)
Atlantic Richfield Co., page 131 (courtesy of American Petroleum Institute)

Released for printing: May 19, 1988

DOE/EIA-0340(87)/1
Distribution Category UC-98

Petroleum Supply Annual 1987

Volume 1

Energy Information Administration
Office of Oil and Gas
U.S. Department of Energy
Washington, DC 20585

This report was prepared by the Energy Information Administration, the independent statistical and analytical agency within the Department of Energy. The information contained herein should not be construed as advocating or necessarily reflecting any policy position of the Department of Energy or any other organization.

EIA Petroleum Data Available In Machine-Readable Files

Petroleum supply statistics are available on five magnetic tapes. One tape contains final 1983 through 1987 petroleum supply statistics by month, taken from the *Petroleum Supply Annual*; the second contains preliminary 1988 statistics to date by month, from the *Petroleum Supply Monthly*. Three additional tapes contain current and historical statistics on imports of crude oil and petroleum products into the United States and Puerto Rico. The current import tape contains preliminary 1988 statistics to date by month. The two historical import tapes contain final statistics by month. One tape contains statistics for the years 1977 through 1985; the second contains 1986 and 1987 statistics. The current tapes are updated each month. All tapes are fully documented.

Tapes are sold for $200 each and should be referenced by National Technical Information Service (NTIS) number:

Petroleum Supply Annual -- 1983-1987	PB88-206719
Petroleum Supply Monthly -- Preliminary (1988)	PB88-207501
Oil Imports into the United States and Puerto Rico, Annual -- 1977-1985	PB87-147781
Oil Imports into the United States and Puerto Rico, Annual -- 1986-1987	PB88-207485
Oil Imports into the United States and Puerto Rico, Monthly -- Preliminary (1988)	PB88-207493

To order, contact:

National Technical Information Service (NTIS)
Office of Data Base Services
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
(703)487-4650

Further information as to content may be obtained from the National Energy Information Center (NEIC), telephone (202)586-8800. The current tapes are also available on a subscription basis. All files available on magnetic tape can be converted into diskette files. (Please contact NTIS for current prices.) Ordering information may be obtained by calling (703)487-4807.

Contacts

The *Petroleum Supply Annual* is prepared by the Petroleum Supply Division of the Office of Oil and Gas, Energy Information Administration, under the direction of Charles C. Heath (202) 586-6860.

Questions and comments concerning the contents of the *Petroleum Supply Annual* may be referred to Ronald W. O'Neill (202) 586-9884, Chief of the Industry Analysis Branch, or the following specialists:

Summary Statistics	Stephen Patterson	(202) 586-5994
Supply and Disposition	Stephen Patterson	(202) 586-5994
Crude Oil Production	David Hinton	(202) 586-2990
Natural Gas Processing	David Hinton	(202) 586-2990
Refinery Operations	Nancy Masterson	(202) 586-8393
Imports	Claudette Graham	(202) 586-9649
Exports	T. C. Swann	(202) 586-1155
Stocks	Beverly Harris	(202) 586-5130
Transportation	Chris Gray	(202) 586-8995
Feature Articles: U.S. Petroleum Supply	Herbert Franklin	(202) 586-5199
	Irvin Chamberlain	(202) 586-9594
U.S. Refinery Capacity: 1988	Nancy Masterson	(202) 586-8393

Additional information on all energy statistics available from the Energy Information Administration may be obtained from the National Energy Information Center (202) 586-8800.

Preface

The Petroleum Supply Annual (PSA) contains information on the supply and disposition of crude oil and petroleum products. The publication reflects data that were collected from the petroleum industry during 1987 through annual and monthly surveys. The PSA is divided into two volumes. This first volume contains two sections, Petroleum Supply Summary and Refinery Capacity, each with final annual data. The second volume contains final statistics for each month of 1987, and replaces data previously published in the *Petroleum Supply Monthly* (PSM). The tables in Volumes I and II are similarly numbered to facilitate comparison between them. Below is a description of each section in Volume I of the PSA.

Petroleum Supply Summary

This section contains a summary of the data presented each month in the PSM and in Volume II of the PSA. It includes a description of the major events in the petroleum industry during 1987 including trends in supply, consumption, and production. Graphs and tables are provided which show 15 years of data depicting the balance between supply, disposition and ending stocks for various commodities including crude oil, motor gasoline, distillate fuel oil, residual fuel oil and liquefied petroleum gases. Tables also provide 1987 detailed statistics on supply and disposition, refinery operations, imports and exports, stocks, and transportation of crude oil and petroleum products.

Refinery Capacity

This section describes major activities within the refinery industry during 1987. The tables are compiled from the Form EIA-820, *Annual Refinery Report*. Of particular note are listings of facilities and associated capacities in each State. In addition, summaries of corporate refinery capacities, refinery storage facilities in selected States, and refinery shutdowns, sales and mergers during 1987 are provided.

Contents

	Page
U.S. Petroleum Supply	xi
Tables	
Summary Statistics	
S1. Crude Oil and Petroleum Products Overview	2
S2. Crude Oil Supply and Disposition	6
S3. Crude Oil and Petroleum Product Imports	8
S4. Finished Motor Gasoline Supply and Disposition	11
S5. Distillate Fuel Oil Supply and Disposition	13
S6. Residual Fuel Oil Supply and Disposition	15
S7. Liquefied Petroleum Gases Supply and Disposition	17
S8. Other Petroleum Products Supply and Disposition	18
Sources of Summary Statistics	19
Detailed Statistics	
National Statistics	
1. U.S. Petroleum Balance	23
2. Supply and Disposition of Crude Oil and Petroleum Products	24
3. Daily Average Supply and Disposition of Crude Oil and Petroleum Products	25
Supply and Disposition of Crude Oil and Petroleum Products	
4. PAD District I	26
5. PAD District II	27
6. PAD District III	28
7. PAD District IV	29
8. PAD District V	30
Production of Crude Oil	
9. Production of Crude Oil (Including Lease Condensate) by PAD District and State	31
Natural Gas Processing	
10. Natural Gas Processing Plant Net Production of Petroleum Products by PAD District	32
Refinery Operations	
11. Refinery Input of Crude Oil and Petroleum Products by PAD District	33
12. Refinery Production of Petroleum Products by PAD District	34
13. Percent Refinery Yield of Petroleum Products by PAD District	35
Imports of Crude Oil and Petroleum Products	
14. Imports of Crude Oil and Petroleum Products by PAD District	36
15. Imports of Crude Oil and Petroleum Products by Source and PAD District	37
Exports of Crude Oil and Petroleum Products	
16. Exports of Crude Oil and Petroleum Products by PAD District	44
17. Exports of Crude Oil and Petroleum Products by Destination	45
Stocks	
18. Stocks of Crude Oil and Petroleum Products by PAD District, December 31, 1987	47
19. Refinery and Bulk Terminal Stocks of Selected Petroleum Products by State, December 31, 1987	52
Movements of Crude Oil and Petroleum Products	
20. Movements of Crude Oil and Petroleum Products by Pipeline, Tanker, and Barge Between PAD Districts	53
21. Movements of Crude Oil and Petroleum Products by Pipeline Between PAD Districts	54

Page

22. Movements of Crude Oil and Petroleum Products by Tanker and Barge Between PAD Districts 55
23. Net Movements of Crude Oil and Petroleum Products by Pipeline, Tanker, and Barge Between PAD Districts 56

Residual Fuel Oil by Sulfur Content

24. Production of Residual Fuel Oil by Sulfur Content by PAD District 57
25. Stocks of Residual Fuel Oil by Sulfur Content by PAD District, December 31, 1987 57
26. Movements of Residual Fuel Oil by Tanker and Barge Between PAD Districts 57
27. Imports of Residual Fuel Oil by Sulfur Content by Country of Origin 58
28. Imports of Residual Fuel Oil by Sulfur Content by State of Entry 59

Refinery Capacity

U.S. Refinery Capacity: 1988 62

Refinery Statistics

29. Number and Capacity of Operable Petroleum Refineries by PAD District and State as of January 1, 1988 68
30. Production Capacity of Operable Petroleum Refineries by State as of January 1, 1988 70
31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 71
32. Refiners' Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 1988 98
33. Operable Crude and Downstream Charge Capacity of Petroleum Refineries, January 1, 1981 to January 1, 1989 102
34. Operable Production Capacity of Petroleum Refineries, January 1, 1981 to January 1, 1989 103
35. Working Storage Capacity at Refineries and Gasoline Blending Plants by PAD District and State as of January 1, 1988 104
36. Shell Storage Capacity at Refineries and Gasoline Blending Plants by PAD District and State as of January 1, 1988 106
37. Refinery Receipts of Crude Oil by Method of Transportation by PAD District, 1987 108
38. Fuels Consumed at Refineries by PAD District, 1987 108
39. New, Reactivated and Shutdown Refineries During 1987 109
40. Refinery Sales During 1987 110

Illustrations

S1. Petroleum Overview 4
S2. Petroleum Products Supplied 4
S3. Crude Oil Supply and Disposition 5
S4. Crude Oil Ending Stocks 5
S5. Finished Motor Gasoline Supply and Disposition 10
S6. Motor Gasoline Ending Stocks 10
S7. Distillate Fuel Oil Supply and Disposition 12
S8. Distillate Fuel Oil Ending Stocks 12
S9. Residual Fuel Oil Supply and Disposition 14
S10. Residual Fuel Oil Ending Stocks 14
S11. Liquefied Petroleum Gases Supply and Disposition 16
S12. Liquefied Petroleum Gases Ending Stocks 16

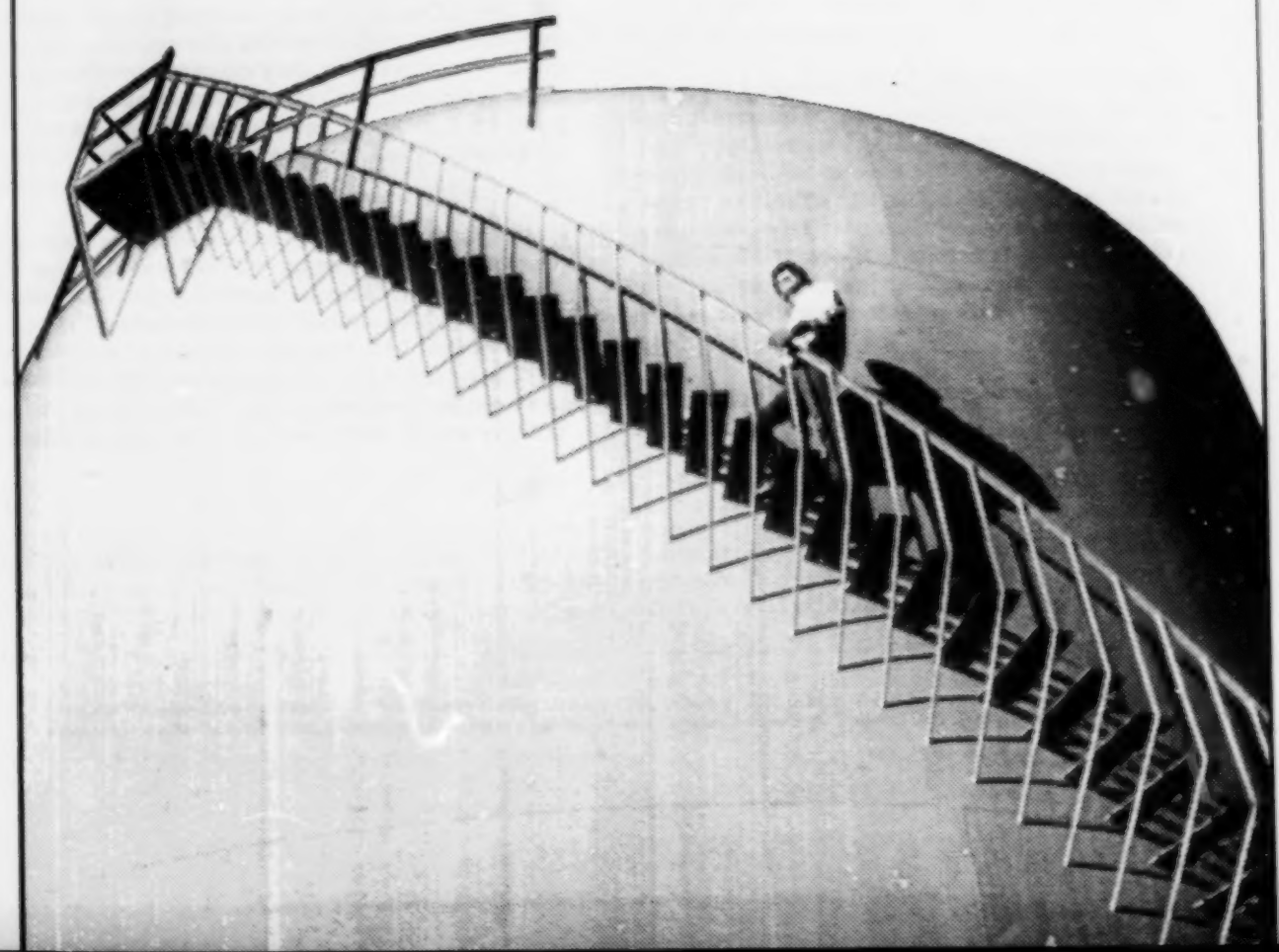
Appendices

A. District Descriptions and Maps 113
B. Explanatory Notes 115

Glossary

Definitions of Petroleum Products and Other Terms 133

Petroleum Supply Summary



U.S. Petroleum Supply

by Herbert Franklin and Irvin Chamberlain

Overview

Demand for petroleum products increased by nearly 0.4 million barrels per day in 1987; this increase was about two-thirds of the 1986 increase. (Demand is measured as "Product Supplied" in the *Petroleum Supply Annual*, and the term is used interchangeably with the term "consumption" throughout this text.) The increased use of petroleum products can be attributed primarily to a 2.7-percent economic expansion (defined as growth in real gross national product) and to an increase of about 1 percent in real disposable personal income, which induced heavier travel. [1] The increase was moderated somewhat by increasing petroleum prices and by winter temperatures that were warmer than normal.

U.S. petroleum supply activity in 1987 was relatively uneventful by comparison with the dramatic events of 1986. It was a year of slow recovery for the exploration and production sectors of the U.S. petroleum industry, which suffered so severely from the plunge in crude oil prices during 1986. The recovery, as evidenced by increased drilling activity (average number of rotary rigs in operation), was not apparent until July when the average number of rotary rigs in operation increased 14 percent over the June average; thereafter, the average number of rotary rigs in operation increased monthly for the remainder of the year.

Uncertainty about the level and stability of crude oil prices in the early months of 1987 may have slowed the turnaround in drilling activities, as investors watched efforts by the Organization of Petroleum Exporting Countries (OPEC) to stabilize prices around a reference price of $18.00 per barrel. By March, the OPEC had reduced crude oil production to 15.85 million barrels per day [2], and imported crude oil prices rose steadily through July. As these trends boosted producer optimism, drilling activity moved sharply upward in July and remained relatively high for the remainder of the year.

Although drilling activity did increase substantially in the latter part of 1987, average drilling activity for the year dropped nearly 3 percent from the low levels of 1986. This is the third consecutive annual decline in drilling activity and most likely will contribute to a further decline in the number of producing wells, resulting in lower domestic production for the next few years.

U.S. crude oil production, which is heavily dependent on continued high levels of drilling activity, declined more than 0.3 million barrels per day from the 1986 level. The crude oil production decline was partially offset by increased natural gas liquids production. The net change in liquid hydrocarbon (crude oil plus natural gas liquids) production for 1987 was a decline of nearly 0.3 million barrels per day. The 1987 decline in crude oil production is probably a result of the decline in drilling activity since 1985, as well as the fact that a large number of stripper wells (wells producing less than 10 barrels per day) that ceased operations in 1986 remained closed.

An increase in petroleum imports was needed to help satisfy growing demand as indigenous production of liquid hydrocarbons dropped for the second straight year. Crude oil imports rose by 0.50 million barrels per day, while product imports declined by more than 0.04 million barrels per day. Most of the imported crude oil was used to meet current demand, but a crude oil stock build of 0.13 million barrels per day implies that a significant portion of the imported crude oil may have been purchased because of the availability of crude oil at bargain prices late in the year.

The year ended on a note of uncertainty as the OPEC extended its June 1987 agreement on production quotas and a crude oil

Note: Unless otherwise referenced, all data reported in this article are from Energy Information Administration publications: *Annual Energy Review* 1986, DOE/EIA-0384(86); *Monthly Energy Review*, December 1987, DOE/EIA-0035 (87/12); and *Petroleum Supply Annual* 1987, Volume 1, DOE/EIA-0340 (87/1), and predecessor reports.

[1] Energy Information Administration, *Short-Term Energy Outlook*, January 1988, DOE/EIA-0202 (88/1Q), (Washington, DC, February 1988), Table 4.
[2] Energy Information Administration, International Contingency and Information Division, International Statistics Data Base, April 1988.

reference price of $18.00 per barrel. The same agreement had been violated repeatedly during the latter half of 1987, especially in August when OPEC production exceeded its 16.6 million barrel-per-day ceiling by 3.8 million barrels per day.[3] Continuation of the same agreement without enforcement of the production quotas is likely to perpetuate oversupply and pricing problems. Within the week following the OPEC agreement in December, spot market prices did indeed plunge to their lowest levels in a year.[4]

Product Demand

The primary factors that affect change in petroleum product demand are national economic growth trends, petroleum price levels, weather conditions, and efforts to conserve petroleum.

Economic expansion is a strong stimulus for increased consumption of petroleum products on a broad scale. Increased industrial production, transport of goods, provision of services, and sales activities all require greater volumes of fuel. A secondary factor that is related to the state of the economy is the amount of disposable income that is available; an expanding economy increases disposable personal income and the amount of personal funds that can be spent on travel and petrochemical products. Conversely, economic recession contracts the various economic activities outlined above, and petroleum use declines.

Low petroleum prices tend to increase purchases of fuel and petroleum-based products. Discretionary efforts to conserve petroleum fuel are reduced; for example, individuals feel free to drive larger, less fuel-efficient vehicles and to travel more miles. Electric utility and industrial plants will substitute lower-priced petroleum fuel and petrochemical feedstocks for more expensive fuel types wherever dual-fired boilers or suitable petrochemical processing equipment permit such substitution. When petroleum prices are relatively high, these trends are reversed.

Weather changes have an obvious impact on the use of heating fuels in winter. During the summer, additional volumes of residual fuel oil are required as a primary fuel for generating electricity used in air conditioning units.

The need to conserve scarce U.S. petroleum supplies became evident during the Arab oil embargo of 1973. Soon thereafter, the Federal Government mandated several far-reaching conservation programs. One of the most significant was the Corporate Average Fuel Economy (CAFE) Standards Program, which led to the manufacture of an ever-increasing number of smaller, more fuel-efficient automobiles. Over time, this one broad-scale conservation measure has had a tremendous impact on the consumption of motor gasoline. The U.S. passenger car fleet increased its fuel efficiency (miles traveled per gallon) by nearly 38 percent from 1973 to 1986. Another Government-mandated conservation program that led to broad-scale savings was the establishment of a national speed limit of 55 miles per hour on interstate highways. This conservation measure was relaxed during 1987 by permitting speed limits up to 65 miles per hour if approved by State governments. In addition to mandated programs, tax incentives induced improvement in building insulation and installation of high-efficiency heating and cooling equipment.

The impact of these and other conservation efforts has been felt throughout the economy. The amount of petroleum consumed per dollar of Gross National Product (GNP) can be used as a measure of the general effectiveness of conservation efforts that pervade the entire U.S. economy. In terms of thousand Btu consumed per 1982 dollar of GNP, petroleum consumption declined from 12.70 in 1973 to 8.54 in 1987 (Table FE1). This represents a 33 percent reduction in petroleum use based on the GNP expressed in constant dollars.

Table FE1. Petroleum Consumption per Constant Dollar of GNP [1]

	GNP[1] (trillion 1982 dollars)	Petroleum Consumption (quadrillion Btu)	Petroleum Consumption per Constant Dollar of GNP[1] (thousand Btu per 1982 dollar)
1973	2.744	34.840	12.70
1978	3.115	37.965	12.19
1983	3.279	30.054	9.17
1987	3.820	32.627	8.54

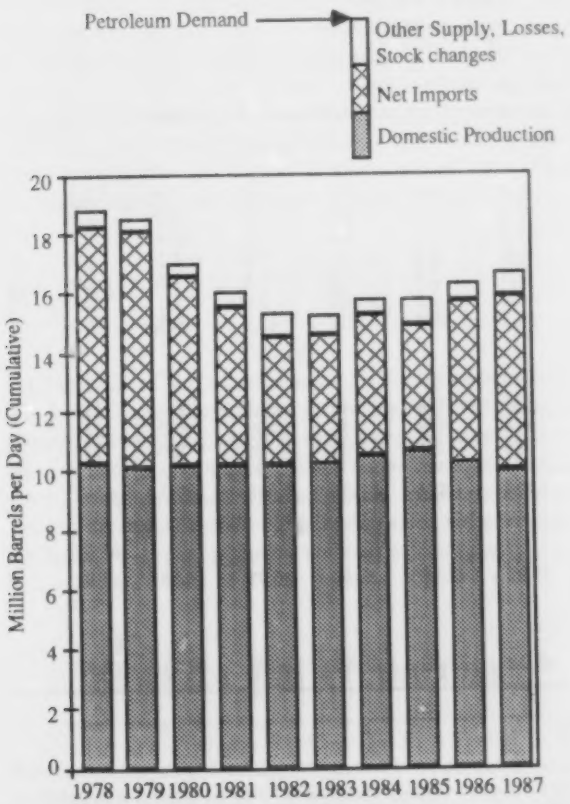
[1] GNP = Gross National Product.
Source: Energy Information Administration, *Monthly Energy Review*, December 1987, Tables 1.4 and 1.7.

[3] Energy Information Administration, International Contingency and Information Division, International Statistics Data Base, April 1988.
[4] Petroleum Intelligence Weekly, *Marketview*, (New York, NY, December 21, 1987), p. 6.

Domestic demand for petroleum products declined for 5 consecutive years from a peak of 18.8 million barrels per day in 1978 to 15.2 million barrels per day in 1983 (Figure FE1). This decline resulted from mandated and price-induced conservation plus economic downturns in 1980 and 1982. During 1984 and 1985, improving economic conditions and declining petroleum prices resulted in a higher level of demand. Total petroleum product demand climbed sharply to 16.3 million barrels per day in 1986, an increase of nearly 0.6 million barrels per day over the 1985 level. This surge in demand was stimulated by a precipitous drop in crude oil prices and continued economic expansion.

During 1987, petroleum product demand rose to 16.7 million barrels per day, largely on the strength of a moderate 2.7 percent growth in economic activity. However, the 1987 increase in petroleum demand was only about two-thirds that of the 1986 increase. This slowdown in the rate of demand growth can be attributed in large part to an increase in petroleum prices, which may have induced some discretionary conservation efforts. Perhaps the most significant factor in causing the slowdown was the substitution by electric utilities of natural gas for relatively expensive residual fuel oil. Winter temperatures were slightly above normal and did not significantly affect 1987 petroleum demand growth.

Figure FE1. Petroleum Supply and Demand, 1978-1987 [1]



[1] Petroleum demand is measured as product supplied.

Source: Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1, Table 3, and predecessor reports.

Motor Gasoline

Motor Gasoline consumption increased to 7.2 million barrels per day in 1987. This can be attributed mainly to general economic expansion and a 1 percent growth in personal disposable income which resulted in higher levels of business and recreational travel.

The 1987 increase in motor gasoline demand marks the fifth consecutive annual increase, but consumption still remains below the peak level of 1978 (Table FE2). This illustrates the effectiveness of the broad-scale conservation programs oriented toward motor gasoline (CAFE standards and national highway speed limit) and of individual discretionary conservation efforts (e.g., carpooling). The effectiveness of conservation is especially emphasized by the relatively low use of gasoline despite the fact that real gasoline costs remained near the record low levels of 1986.

Distillate Fuel Oil

Distillate fuel oil is used principally in the transportation sector of the economy to power buses, trucks, trains, and a small percentage of passenger vehicles. Other significant uses are for heating residential and commercial buildings and for firing industrial and electric utility boilers.

Demand for distillate fuel oil rose to a level of 3.0 million barrels per day in 1987. The growth in demand helped meet the increased transportation and industrial needs of the growing economy. Because of a warmer than normal winter, heating use was not much of a factor in the increased use of distillate fuel oil.

Residual Fuel Oil

The most important use of residual fuel oil is as a primary fuel for electric utility plants. Next in importance is its use as a bunkering fuel in ocean-going vessels, and close behind that, as a boiler fuel at industrial plants. A fourth and relatively minor use is as a heating fuel in commercial buildings.

Table FE2. U.S. Petroleum Supply--Salient Statistics, 1978-1987

Supply Elements	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Indigenous Production										
(million barrels per day)										
Crude Oil	8.7	8.6	8.6	8.6	8.6	8.7	8.9	9.0	8.7	8.3
Natural Gas Liquids	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Other[1]	.1	s	s	s	.1	.1	s	.1	.1	.1
Total[2]	10.3	10.2	10.2	10.2	10.3	10.3	10.6	10.6	10.3	10.0
Imports										
(million barrels per day)										
Crude Oil (Industry)	6.2	6.5	5.2	4.1	3.3	3.1	3.2	3.1	4.1	4.6
Crude Oil (SPR)[3]	.2	.1	s	.3	.2	.2	.2	.1	s	.1
Products	2.0	1.9	1.6	1.6	1.6	1.7	2.0	1.9	2.0	2.0
Total[2]	8.4	8.5	6.9	6.0	5.1	5.1	5.4	5.1	6.2	6.7
Exports										
(million barrels per day)										
Crude Oil	.2	.2	.3	.2	.2	.2	.2	.2	.2	.2
Products	.2	.2	.3	.4	.6	.6	.5	.6	.6	.6
Total[2]	.4	.5	.5	.6	.8	.7	.7	.8	.8	.8
Stock Withdrawal										
(million barrels per day)										
Crude Oil (Industry)	.1	(.1)	(.1)	s	s	s	(s)	.1	(s)	(s)
Crude Oil (SPR)[3]	(.2)	(.1)	(s)	(.3)	(.2)	(.2)	(.2)	(.1)	(.1)	(.1)
Products	.2	(s)	(s)	.1	.3	.2	(.1)	.2	(.1)	.1
Total[2]	.1	(.2)	(.1)	(.2)	.1	s	(.3)	.1	(.2)	(s)
Products Supplied										
(million barrels per day)										
Motor Gasoline	7.4	7.0	6.6	6.6	6.5	6.6	6.7	6.8	7.0	7.2
Distillate Fuel Oil	3.4	3.3	2.9	2.8	2.7	2.7	2.8	2.9	2.9	3.0
Residual Fuel Oil	3.0	2.8	2.5	2.1	1.7	1.4	1.4	1.2	1.4	1.3
Jet Fuels	1.1	1.1	1.1	1.0	1.0	1.0	1.2	1.2	1.3	1.4
Liquid Petroleum Gases	1.4	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.5	1.6
Other Petroleum	2.5	2.7	2.5	2.1	1.9	2.0	2.0	2.0	2.1	2.2
Total	18.8	18.5	17.1	16.1	15.3	15.2	15.7	15.7	16.3	16.7
Year-End Stocks										
(million barrels)										
Crude Oil (Industry)	309	339	358	363	350	344	345	321	331	349
Crude Oil (SPR)[3]	67	91	108	230	294	379	451	493	512	541
Products	902	911	926	891	786	731	760	705	750	718
Total[2]	1,278	1,341	1,392	1,484	1,430	1,454	1,556	1,519	1,593	1,607
Average Refiner Acquisition Cost of Crude Oil (dollars per barrel)	12.46	17.72	28.07	35.24	31.87	28.99	28.63	26.75	14.55	17.91
Average Domestic First Purchase Price of Crude Oil (dollars per barrel)	9.00	12.64	21.59	31.77	28.52	26.19	25.88	24.09	12.51	15.41

[1] Includes other hydrocarbons and alcohol.
[2] Totals may not equal sum of components due to independent rounding.
[3] SPR = Strategic Petroleum Reserve.
s = Less than 0.05 million barrels per day.
( ) = Stock build.
Sources: Energy Information Administration, *Annual Energy Review 1986*; Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1 and predecessor reports; Energy Information Administration, *Monthly Energy Review*, December 1987.

Residual fuel oil demand fell to a level of 1.3 million barrels per day in 1987. Thus a long-term declining trend in residual fuel oil consumption resumed after being interrupted in 1986 (Table FE2) when electric utilities and perhaps some industrial plants opted to switch from relatively expensive natural gas. Electric utilities and industrial plants switched away from residual fuel oil in 1987 when it lost its price advantage. Residual fuel oil has now dropped below jet fuel in significance as a leading petroleum product in the United States.

Liquefied Petroleum Gases

Industrial facilities, particularly petrochemical plants and petroleum refineries, used nearly three-fourths of the liquefied petroleum gases (LPG's) consumed in 1986. Most of the remainder were used by the residential and commercial sectors, and a small volume was consumed for transportation. In addition to the technical advantage of LPG's as a fuel in petrochemical processing activities, LPG's also have a price advantage over heavier, refinery-processed hydrocarbons for use as petrochemical raw materials.

LPG consumption dropped during 1986, when naphtha was abundant and cost less than LPG's, giving it a temporary price advantage as a petrochemical feedstock. As crude oil prices increased in 1987, naphtha lost its price advantage, and petrochemical manufacturers switched back to a greater use of LPG's in petrochemical manufacturing activities. Consequently, LPG demand increased to a level of 1.6 million barrels per day in 1987, about the same level as in 1985.

Jet Fuel

Consumption of jet fuel increased to 1.4 million barrels per day in 1987. Increased use of jet fuel during 1987 resulted primarily from the expansion in economic activity and disposable personal income which fostered higher levels of business and recreational travel. An additional inducement to increased recreational travel was bargain-priced airfares resulting in part from the relatively low cost of kerosene-type jet fuel.

Reserves and Production

Indigenous production of liquid hydrocarbons continues to be the principal source of U.S. petroleum supply (Table FE2). However, the U.S. production base consists mainly of old fields with declining reservoir pressures.[5] Average crude oil productivity per well dropped from a peak level of 18.4 barrels per day in 1972 to 13.9 barrels per day in 1986. Areas believed to have most of the remaining potential for finding large, prolific fields are in high-cost environments (i.e. deep water and Arctic regions).[6]

U.S. Companies have been unable to sustain significant increases in national production of liquid hydrocarbons despite vast capital expenditures in the early 1980's (Table FE3). In fact, these large investments have merely enabled U.S. companies to forestall an inevitable production decline resulting from the predominance of old, heavily worked fields that characterize much of the U.S. petroleum production base.

Total U.S. liquid hydrocarbon production (from Alaska plus the lower 48 States) reflects highly stable production activity from 1980 through 1983. However, this overall picture of stability hides a very important distinction between production from Alaska and from the lower 48 States. Alaskan output has been growing annually since its North Slope fields began production in 1977; the only exception was in 1981 when a small decline occurred. On the other hand, production from the lower 48 States has been experiencing a general decline because of the predominance of old fields that are suffering a natural drop in productivity.

Table FE3. Crude Oil Prices, Capital Expenditures, and Well Completions

Year	Crude Oil First Purchase Price (dollars per barrel)	Capital Expenditures[1] (billion dollars)	Well Completions (thousand wells)
1979	12.64	25.8	51.91
1980	21.59	40.2	69.84
1981	31.77	65.4	90.03
1982	28.52	60.4	83.43
1983	26.19	50.5	74.90
1984	25.88	52.0	84.35
1985	24.09	48.7	69.17
1986	12.51	30.4	37.89
1987	15.41	NA	33.32

[1] Capital expenditures for exploration and production.
NA= Not available.
Sources: Crude Oil Prices -- Energy Information Administration, *Monthly Energy Review*, December 1987, Table 9.1; Capital Expenditures -- Energy Information Administration, *Financial Reporting System* (Form EIA-28); Well Completions -- Energy Information Administration, *Monthly Energy Review*, December 1987, Table 5.2.

[5] Energy Information Administration, *Impact of Surveillance Fields on Crude Oil Production in the United States*, DOE/EIA-0459, (Washington, DC, November 1984), p. 11.

[6] National Petroleum Council, *Factors Affecting U.S. Oil and Gas Outlook*, (Washington, DC, February, 1987), p. 126.

The declining trend in production in the lower 48 States was reversed in 1983 and 1984 by the effects of extensive infill development (drilling of additional wells between existing wells in a producing reservoir) in the early 1980's (Table FE3). When the increased production from the lower 48 States complemented growing Alaskan output in 1984, total U.S. production turned sharply upward. As the effects of intensive drilling activity in the early 1980's began to wane, lower 48-State production resumed its downward trend, but total U.S. liquid hydrocarbon production was buoyed by expanding Alaskan production that helped the U.S. achieve an overall production gain in 1985.

The crude oil price crash of 1986 caused many unprofitable stripper wells to be shut in. During 1986, liquid hydrocarbon production dropped, on average, 0.3 million barrels per day, reversing the gain made in 1984. The smaller number of producing wells in combination with declining productivity in many of the producing wells led to a further decline in production during 1987 of 0.3 million barrels per day. Thus, in 1987, U.S. liquid hydrocarbon production dropped to its lowest level in 10 years (Table FE2).

Proved Reserves

Proved reserves make up the defined pool of hydrocarbons from which U.S. companies can currently extract oil and gas. They comprise the domestic petroleum production base and are the primary source of oil and gas used in the United States. To the extent that this pool of oil and gas cannot satisfy domestic needs, the United States must draw down stocks or look abroad for additional supplies to meet current demand.

Estimates of the volume of total U.S. proved reserves are continually changing as greater knowledge of the oil reservoirs is gained by increased drilling and well development. As additional wells are completed, the extent of a reservoir can be more accurately delineated. This sometimes results in a reassessment of the volume of oil contained in the reservoir; additional volumes are referred to as "extensions." [7]

Of greater significance for the U.S. petroleum supply is the additional oil that can be extracted from known deposits by increasing the number of wells penetrating an oil reservoir; this brings larger portions of the reservoir closer to production outlets. This conventional recovery method, known as infill development, has been the chief means of increasing production in recent years. [8]

Substantial costs are associated with well-drilling activity. The magnitude of drilling activity undertaken by investors relates directly to current crude oil and natural gas price levels and to the perceived nature of future price trends. Average crude oil first-purchase (wellhead) prices plummeted 48 percent in 1986 (Table FE3). Prices recovered somewhat during 1987 but were declining again by the end of the year, thereby displaying a continuing price instability. Wellhead prices for natural gas have declined 36 percent since 1984. These downward price trends and the price instability during 1987 are reflected in the precipitous drop of 45 percent in well completions during 1986 and a continued decline of 12 percent in 1987 (Table FE3).

As well completions dropped in 1986, proved reserves of liquid hydrocarbons followed, dropping 3.6 percent (Table FE4). While proved reserves of natural gas liquids actually increased by 2.8 percent in 1986, crude oil reserves declined by 5.4 percent. [9] The 1986 decline stems from a 46-percent drop in total crude oil discoveries (i.e., extensions of existing reservoirs, and findings of new reservoirs and fields) and from a smaller than normal annual upward revision to previous estimates of crude oil reserves. Together, total discoveries

Table FE4. Proved Reserves of Liquid Hydrocarbons
(Million Barrels)

Year	Crude Oil	Natural Gas Liquids	Total
1978	31,355	6,772	38,127
1979	29,810	6,615	36,425
1980	29,805	6,728	36,533
1981	29,426	7,068	36,494
1982	27,858	7,221	35,079
1983	27,735	7,901	35,636
1984	28,446	7,643	36,089
1985	28,416	7,944	36,360
1986	26,889	8,165	35,054

Source: Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1986 Annual Report*, Table 1.

[7] Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, DOE/EIA-0216(86), (Washington, DC, October 1987), p. 99.
[8] National Petroleum Council, *Factors Affecting U.S. Oil and Gas Outlook*, (Washington, DC, February, 1987), p. 129.
[9] Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, DOE/EIA-0216(86), (Washington, DC, October 1987), Table 1.

and revisions of crude oil reserve estimates resulted in an increase of 1,446 million barrels of proved reserves. However, proved crude oil reserves were depleted by 2,973 million barrels, resulting in a net decline of 1,527 million barrels from 1985 to 1986.[10]

Data are not yet available on reserve development activity in 1987. However, on the basis of price trends and the number of well completions reported for the year, some inferences can be made. During 1987, crude oil wellhead prices climbed steadily from an average level of $13.89 per barrel in January to a peak of $17.06 per barrel in August, and then declined to $14.27 per barrel in December. It appears that the positive movement in crude oil prices from January to August did induce a midyear increase in drilling activity after a decline in the early months. Despite this late surge, the average number of rotary rigs in operation during 1987 was nearly 3 percent lower than the average number for 1986. On the basis of the decrease in the annual average level of rotary rig activity, it can be inferred that proved reserves declined again in 1987.

Indigenous Production

As noted earlier, most U.S. producing fields are old and are experiencing a natural decline in productivity. Without increased production from prolific new fields and/or sustained high levels of infill drilling and the application of enhanced oil recovery techniques, overall U.S. production of liquid hydrocarbons will decline.

Although crude oil wellhead prices increased steadily for the first 8 months of 1987, drilling activity (as measured by the average number of rotary rigs in operation) declined and remained at very low levels until moving sharply upward in the second half of the year. The early decline can be attributed to a prevailing uncertainty about the ability of OPEC to raise and maintain higher crude oil price levels through adoption of fixed pricing and controlled production levels. Although drilling activity did increase substantially in the second half of the year, the annual average level of rotary rig activity remained under the low of 1986. This implies a further decline in domestic liquid hydrocarbon production extending into 1988 and beyond.

Total U.S. indigenous production of liquid hydrocarbons during 1987 continued the annual decline that began in 1986 after 6 years of small to moderate gains. The 1987 decline in production can be attributed to two principal factors. First, and perhaps foremost, the decrease in annual well completions since 1985 (Table FE3) reflects a decline in the requisite infill development necessary to stem the natural decline in productivity suffered by most U.S. oil fields. Second, crude oil prices have not risen enough to induce operators to reopen many of the stripper wells that were closed during 1986. However, some producers whose wells had been inactive for extended periods may have been forced to resume production despite relatively low crude oil prices or else plug their wells.[11]

More than three-fourths of total U.S. production takes place in five Regions; Texas, Alaska, California, Federal Offshore Regions, and Louisiana (Table FE5). All of these Regions except Alaska experienced production declines in 1987. The combined decrease in production for Texas, California, Federal Offshore Regions, and Louisiana amounted to 101

Table FE5. Crude Oil Production by Major Producing Regions
(Million Barrels)

Geographic Region	1985	1986	1987
Texas	869.2	819.6	761.0
Onshore	867.1	817.5	759.2
Offshore (State)	2.1	2.1	1.8
Alaska	666.2	681.3	716.0
Onshore	651.6	665.9	693.2
Offshore (State)	14.6	15.4	22.7
California	394.0	378.1	364.6
Onshore	353.6	343.4	334.2
Offshore (State)	40.5	34.7	30.4
Federal Offshore	373.3	378.9	356.6
PAD District III	343.4	350.3	325.5
PAD District V	29.9	28.6	31.1
Louisiana	184.4	181.8	175.0
Onshore	158.8	155.2	149.9
Offshore (State)	25.6	26.6	25.2
Other States	787.4	728.6	674.2
Total U.S.	3,274.6	3,168.3	3047.4

Note: Regional totals may not equal sums of components due to independent rounding.

Sources: Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1, Table 9 and predecessor reports.

[10] Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, DOE/EIA-0216(86), (Washington, DC, October 1987), Table 1.

[11] Oil Daily, *Rising Oil Prices Coaxing Stripper Well Producers*, (Washington, DC, June 25, 1987), pp. 1, 2.

million barrels, nearly 84 percent of the total U.S. decline. The largest drop, of 58.6 million barrels, occurred in Texas where most production takes place in old heavily worked onshore fields that require substantial infill drilling and/or application of enhanced oil recovery techniques to offset natural declines in productivity. Federal Offshore Regions suffered the next largest production decline, a drop of more than 22 million barrels. Here, production dropped because very costly drilling activity has been suppressed by relatively low and unstable crude oil prices. California and Louisiana, like Texas, suffered most of their production losses in older onshore fields where production levels cannot be maintained without the use of infill drilling and enhanced oil recovery techniques.

Of the major producing Regions, only Alaska showed an increase in production levels during 1987. Alaska's oil fields have not yet experienced the loss in natural reservoir pressure that plagues the older producing areas of the lower 48 States. Some Alaskan producing reservoirs are expected to begin to experience declines in productivity within the next few years. In 1987, about 94 percent of Alaskan production came from 2 fields: Prudhoe Bay (1.57 million barrels per day) and Kuparuk River (0.28 million barrels per day). A significant addition to Alaskan production was the new Endicott Field which began deliveries to the Trans-Alaskan Pipeline in October 1987; it produced at a rate of 0.06 million barrels per day in October and about 0.12 million barrels per day in November and December.[12]

Foreign Trade

Imports of petroleum are needed to satisfy the portion of U.S. petroleum demand that cannot be met by domestic production and stock drawdown. U.S. domestic production of liquid hydrocarbons has not increased dramatically since the late 1960's, and the outlook for any marked improvement is very bleak. Domestic production is likely to continue its decline of the past 2 years. Stock drawdown ordinarily has relatively little impact on meeting demand. During 1986 and 1987, low crude oil prices led to reduced domestic petroleum production on the one hand and large increases in petroleum product demand on the other. The inevitable result was a large increase in imports in 1986 and a smaller, but still significant increase in imports in 1987.

Exports make up only a small portion of total U.S. foreign trade in petroleum. U.S. refiners use exports as an outlet for domestically refined products that are in excess of regional needs or unsuitable for domestic use.

Foreign Dependence

When domestic petroleum demand reached its highest level in 1978, the United States was heavily dependent on imported oil. Net imports dropped 46 percent over the next 7 years, as the gap between domestic production and demand narrowed (Figure FE1). The need for imported oil diminished over this period mainly because of a price-induced drop in demand of 17 percent, but also in response to a 3-percent increase in domestic production. Improvement in U.S. self-sufficiency ended with the price crash of 1986 that devastated the exploration and development sector of the U.S. petroleum industry and, at the same time, induced higher consumption of petroleum products. During 1986, indigenous production of liquid hydrocarbons dropped, low petroleum prices led to some stock building, and use of petroleum increased. The result was an increase in U.S. imports of almost 1.2 million barrels per day.

In 1987 the U.S. petroleum supply and demand pattern was similar to that of 1986. Again, indigenous production of liquid hydrocarbons dropped, low petroleum prices led to crude oil stock building, and petroleum use increased. The main difference between 1986 and 1987 was that during 1987, stock building and petroleum demand increased on a smaller scale than in 1986. The result was a smaller increase in petroleum imports during 1987.

U.S. crude oil imports rose 0.50 million barrels per day in 1987 while product imports declined more than 0.04 million barrels per day; this represents a net increase in total petroleum imports of about 0.45 million barrels per day over 1986 levels. Crude oil imports exhibited the largest changes throughout 1987, increasing from 4.4 million barrels per day in January to 5.5 million barrels per day in August before turning downward and ending the year at an average level of 4.6 million barrels per day during December. Product imports remained fairly stable on a month-to-month basis and ended the year at an average 2.1 million barrels per day in December, only 0.2 million barrels per day higher than the January level.

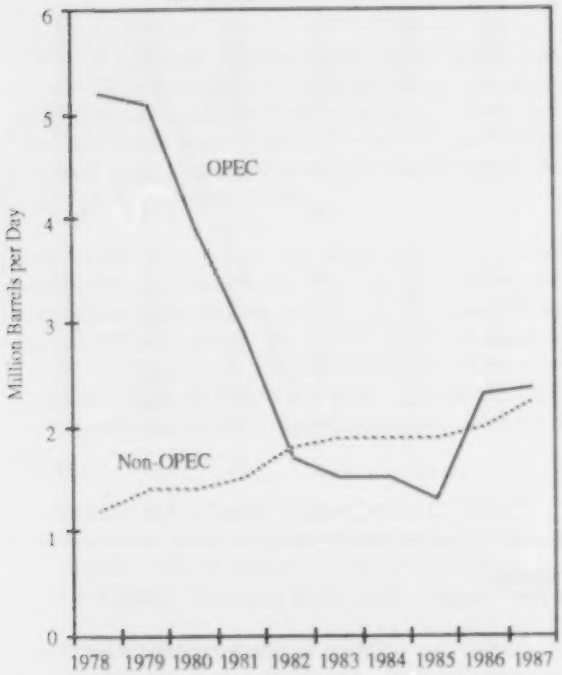
U.S. refiners preferred to meet 1987 demand for petroleum products by direct throughput of imported crude. This is indicated by the large increase in crude oil imports from April through August 1987 and a similar pattern of increasing refinery crude oil inputs along with relatively high refinery utilization rates. Thus the refiners could retain crude oil stocks in an environment of uncertain prices (average f.o.b. crude oil import prices rose from $15.30 per barrel in January to $17.92 per barrel in July and subsequently declined to $15.41 per

[12]Alaskan Oil and Gas Conservation Commission Bulletin, December 1987, p.1.

barrel in December). As peak summer demand passed and refinery activity slowed, lower import volumes were needed and crude oil import levels declined for the remainder of 1987.

As crude oil imports increased, U.S. dependence on OPEC also increased but remained far below the levels of the late 1970's and early 1980's (Figure FE2). OPEC countries

Figure FE2. OPEC Versus Non-OPEC Imports of Crude Oil, 1978-1987



Sources: Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1, Table 15, and predecessor reports.

provided 51 percent of U.S. crude oil imports in 1987 (Table FE6). About 20 percent of U.S. crude oil imports comes from the politically volatile Persian Gulf countries. An additional 30 percent comes from nearby non-OPEC Western Hemisphere nations. Overall, the United States imports crude oil from sources that are widely dispersed geographically; this wide dispersal of suppliers increases the security of U.S. supplies from foreign sources.

Export Trends

U.S. refiners function primarily to meet U.S. petroleum product demand. However, there is often an imbalance between refinery yield and product demand within a refiner's market area, causing the refiner to market excess products either in another domestic region or in foreign areas.[13]

Most petroleum products are exported from the gulf coast (Petroleum Administration for Defense (PAD) District III) and the west coast (PAD District V), where the first and third heaviest concentrations of U.S. refinery capacity, respectively, are situated. Production and export of heavy products is greatest from the west coast because of the large volumes and physical makeup of the very heavy crude oils (averaging 25.21 degrees API gravity) that are processed there. In addition, product specifications (e.g., sulfur levels) may preclude the use of some locally produced fuel oils in parts of that region. Gulf coast exports can be attributed mainly to the large volume of products refined; 46 percent of U.S. refinery production occurred there in 1987.

Total export levels have more than doubled over the past decade but have remained very stable over the past 3 years (Table FE7). Petroleum coke and residual fuel oil continue to be the principal export products. During 1987, about 42 percent of petroleum coke production and 21 percent of residual fuel oil output were exported. Residual fuel oil exports dropped in 1986 because of increased use by domestic electric utilities, as residual fuel oil benefitted from a price advantage over natural gas. In 1987 the residual fuel oil price advantage disappeared. Electric utilities with dual-firing capability switched back to cheaper natural gas. Domestic consumption of residual fuel oil by utilities dropped, and as a consequence, exports of residual fuel oil increased.

Exports of crude oil are restricted to crude oil produced from fields under the State waters of Alaska's Cook Inlet, certain domestically produced crude oil destined for Canada, and shipments to U.S. territories. During 1987, crude oil exports remained at the 1986 level of 0.15 million barrels per day. Nearly 0.13 million barrels per day (87 percent of the total crude oil exported) went to U.S. territories in the Caribbean. Most of the remainder was exported to Canada and a small volume was shipped to the Far East.

Inventory Activity

Petroleum products are produced and delivered to consumers via complex interrelated systems of transportation, storage, processing, and distribution. The storage segment of this interrelated network and the inventories contained therein play a vital role in assuring an uninterrupted and adequate flow of petroleum products to consumers.

The primary concern of inventory managers is to ensure that a minimum operating inventory (MOI) is maintained at

[13] National Petroleum Council, *U.S. Petroleum Refining*, (Washington, DC, October 1986), p. 6.

Table FE6. Gross Imports of Crude Oil by Country of Origin, 1978-1987

(Million Barrels per Day)

Country of Origin	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Arab OPEC										
Algeria	0.63	0.61	0.46	0.26	0.09	0.18	0.19	0.08	0.08	0.11
Iraq	.06	.09	.03	.00	s	.01	.01	.05	.08	.08
Kuwait	.01	.01	.03	.00	s	.01	.02	s	.03	.07
Qatar	.06	.03	.02	.01	.01	.00	s	.00	.01	.00
Saudi Arabia	1.14	1.35	1.25	1.11	.53	.32	.31	.13	.62	.64
United Arab Emirates	.39	.28	.17	.08	.08	.02	.09	.04	.04	.06
Libya	.64	.64	.55	.32	.02	.00	.00	.00	.00	.00
Subtotal Arab OPEC	2.93	3.00	2.50	1.77	.74	.53	.63	.30	.85	.96
Other OPEC										
Ecuador	.04	.03	.02	.04	.03	.06	.05	.06	.06	.02
Gabon	.04	.04	.03	.04	.04	.06	.06	.05	.02	.03
Indonesia	.53	.38	.31	.32	.23	.32	.30	.29	.30	.26
Nigeria	.91	1.07	.84	.61	.51	.30	.21	.28	.44	.53
Venezuela	.18	.29	.16	.15	.16	.16	.25	.31	.42	.49
Iran	.55	.30	.01	.00	.04	.05	.01	.03	.02	.10
Subtotal Other OPEC	2.25	2.11	1.36	1.15	1.00	.94	.88	1.01	1.26	1.43
Total OPEC	5.18	5.11	3.86	2.92	1.73	1.48	1.51	1.31	2.11	2.40
Non-OPEC										
Mexico	.32	.44	.51	.47	.65	.77	.66	.72	.62	.60
Canada	.25	.27	.20	.16	.21	.27	.34	.47	.57	.61
United Kingdom	.17	.20	.17	.37	.44	.37	.38	.28	.32	.30
Trinidad and Tobago	.14	.12	.12	.10	.09	.08	.09	.10	.09	.08
Angola	.01	.04	.04	.05	.04	.07	.09	.10	.10	.18
Norway	.10	.08	.14	.11	.10	.07	.11	.03	.05	.07
Colombia	.00	.00	.00	.00	.00	.00	.00	.00	.06	.11
All Other	.19	.26	.22	.21	.22	.23	.25	.20	.25	.32
Subtotal Non-OPEC	1.17	1.41	1.40	1.47	1.76	1.85	1.91	1.89	2.07	2.27
Total Imports	6.36	6.52	5.26	4.40	3.49	3.33	3.43	3.20	4.18	4.67

s=Less than 0.01 million barrels per day.
Note: Totals may not equal sums of components due to independent rounding.
Source: Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1, Table 15 and predecessor reports.

Table FE7. Exports of Crude Oil and Major Products, 1978-1987

(Million Barrels per Day)

Commodity	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Crude Oil	0.16	0.24	0.29	0.23	0.24	0.16	0.18	0.20	0.15	0.15
Natural Gas Liquids	.02	.02	.02	.04	.07	.07	.05	.06	.04	.04
Distillate Fuel Oil	(s)	(s)	(s)	(s)	.07	.06	.05	.07	.10	.07
Residual Fuel Oil	.01	.01	.03	.12	.21	.19	.19	.20	.15	.19
Petroleum Coke	.11	.15	.14	.14	.16	.20	.19	.19	.24	.21
Other Products	.06	.06	.06	.06	.08	.06	.06	.06	.10	.11
Total Exports	.36	.47	.54	.60	.82	.74	.72	.78	.78	.76

s=Less than 0.01 million barrels per day.
Note: Totals may not equal sums of components due to independent rounding.
Source: Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1, Table 16 and predecessor reports.

critical points throughout the transportation, processing, and distribution network (see box for explanation). The MOI is a fairly stable inventory level that changes slowly in response to major structural changes in the transportation, processing, and distribution systems. Inventory levels above the MOI are much more volatile and change more frequently in response to short-term changes in petroleum demand, financial conditions, and political developments that may threaten the security of petroleum supply flows.

Minimum Operating Inventory

Minimum Operating Inventory is defined as "the level of inventory that is necessary to maintain smooth operations and avoid runouts and below which operating problems and shortages would begin to appear in a defined distribution system." It consists of two parts, namely, unavailable inventory and working inventory.

Unavailable inventory, as the name implies, is totally unavailable for consumption, but is essential for the operation of transportation, processing, and storage facilities. Working inventory and associated storage space is needed to ensure the smooth, continuous day-to-day operation of the distribution system. Specifically, the working inventory and associated storage space are needed to:

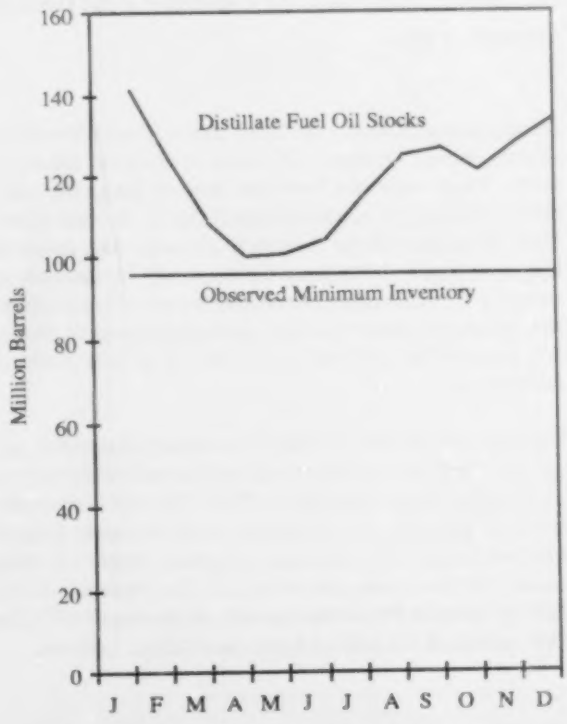
- Balance the irregular, large-volume receipts of crude oil and large irregular shipments of finished products with the relatively slow rate of refinery processing.
- Provide a reserve supply of crude oil and product storage space to ensure continuous refinery operations in the event of transportation disruption to or from refinery.
- Provide storage space for accumulation of unfinished oils in sufficient quantities for blending operations.

Petroleum product stock levels declined to an 18-year low of 705 million barrels by the end of 1985, generally following a long-term decline in petroleum demand which began in 1979 (Table FE2). Industry crude oil stocks remained fairly stable throughout the same period. Ample crude oil stocks afforded refiners an opportunity to meet product demand by using underutilized refining capacity to convert crude oil into needed products. During 1986, product inventories were boosted to 750 million barrels, as refiners operated closer to distillation capacity limits and higher product stocks were considered necessary in view of climbing demand. Higher product stock levels may also have resulted from high-level refinery output in 1986 that may have caused stocking of some excess products. Very low crude oil acquisition costs and low inventory holding costs induced a buildup during 1986 of 10 million barrels in privately owned crude oil inventories to a level of 331 million barrels at the end of 1986.

Inventory activity was fairly stable throughout 1987, generally following normal seasonal changes without any exaggerated swings up or down. Total privately owned industry stocks declined about 14 million barrels. This overall decline masks a larger 32 million-barrel drawdown in product stocks that was offset to some degree by an 18 million-barrel buildup in industry-owned crude oil stocks (Table FE2). By the end of 1987, product stock levels were down to 718 million barrels, and industry-owned crude oil stocks had risen to 349 million barrels.

Product stocks were drawn down most heavily early in 1987 to meet winter demand for heating fuels. Distillate fuel oil stocks were depleted at a normal rate during the winter season (Figure FE3). This was possible, despite relatively low distillate fuel supply from refinery production and imports,

Figure FE3. Distillate Fuel Oil Stock Levels, 1987



Sources: Stock Levels -- Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1, Table S2; Observed Minimum Inventory -- Energy Information Administration, *Weekly Petroleum Status Report*.

because temperatures were warmer than normal. The seasonal buildup of primary distillate stocks (usually from May through November) was much less pronounced than usual in 1987. This may be explained by low heating oil prices that may have induced a buildup in secondary stocks by wholesalers with the expectation of future price increases. The early winter drawdown, coupled with the lower than usual seasonal buildup later in the year, left primary distillate fuel oil stocks nearly 21 million barrels lower by the end of 1987.

Motor gasoline stocks were built up in January 1987 and remained higher than normal through May because of relatively high refinery production levels. When refinery output returned to more normal levels, high consumption levels of motor gasoline were met to a greater extent from primary stock withdrawals. Gradually, motor gasoline stocks declined until they reached a level 5 million barrels lower than they were at the beginning of 1987.

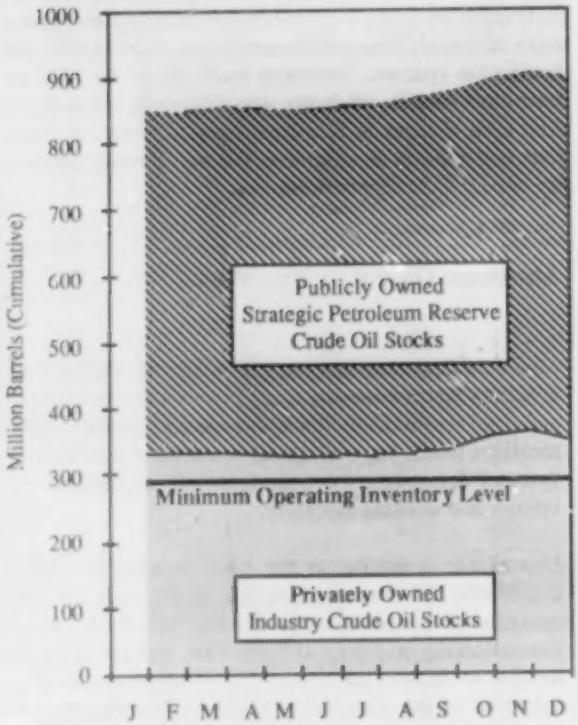
Crude oil stock levels in 1987 remained stable until July when they began rising. This inventory buildup resulted primarily from bargain prices brought on by OPEC overproduction and discount pricing. A contributing factor may have been the rising political tensions in the Persian Gulf that portended a possible supply disruption and higher prices.

Security Afforded by Current Petroleum Inventories

Privately owned industry stocks are currently maintained only slightly above estimated MOI levels or observed minimum levels. These minimum levels are used to gauge the sufficiency of stocks to maintain normal day-to-day operations. They do not provide for reserves to accommodate severe or long-term supply disruptions. Consequently, by themselves, current levels of privately owned industry stocks would afford little protection against a large, international supply disruption such as that suffered during the 1973-1974 Arab oil embargo.

The U.S. Government is filling several reservoirs with crude oil. The stocks in these reservoirs are known collectively as the Strategic Petroleum Reserve (SPR). The SPR in combination with privately owned industry crude oil stocks (Figure FE4) makes the U.S. crude oil emergency supply far more secure. It is the present goal of the U.S. Government to fill the SPR to a level of 750 million barrels. At the end of 1987, the SPR contained 541 million barrels and filling continues.

Figure FE4. Crude Oil Stock Levels, 1987



Sources: Stock Levels -- Energy Information Administration, *Petroleum Supply Annual 1987*, Volume 1, Table S5; Minimum Operating Inventory -- National Petroleum Council, *Petroleum Inventories and Storage Capacity*, June 1984, p. 3.

Refinery Capacity and Utilization

Crude oil distillation capacity is sometimes used as a general measure of the U.S. petroleum industry's ability to satisfy petroleum product demand by use of domestic processing facilities. Over the long term, refinery distillation capacity has generally increased or decreased in parallel with product demand. U.S. distillation capacity ordinarily trails demand, but an abrupt downturn and subsequent steep decline in demand from 1979 through 1983 resulted in excessive crude oil distillation capacity. This situation persisted until 1985 by which time crude oil distillation capacity had been reduced to a level slightly below product demand.

The rate at which distillation capacity is utilized is a measure of the ability of U.S. refiners to meet short-term changes in

petroleum product requirements. The utilization rate can also be used as a measure of efficient refinery operation. The rate of utilization can fluctuate widely because changes in petroleum product demand and the resulting changes in refinery operations occur more rapidly than changes in crude oil distillation capacity.

Crude oil distillation capacity was utilized at an average rate of more than 90 percent during the 30-year period from 1950 through 1979. This sustained high rate of utilization is a general benchmark for efficient levels of distillation capacity use. From 1980 through 1985, when distillation capacity exceeded petroleum product demand, the average distillation capacity utilization rate dropped to a less efficient 73 percent, as a large portion of distillation capacity remained idle.

In 1986, refinery efficiency improved as the annual average distillation capacity utilization rate increased to nearly 83 percent. Crude oil distillation capacity declined to 15.5 million barrels per day and petroleum product demand rose sharply to 16.3 million barrels per day. Consequently, it was necessary to use a larger portion of remaining distillation capacity to meet the higher level of demand.

Utilization of distillation capacity reached 83.1 percent during 1987 as distillation capacity expanded to 15.6 million barrels per day; refinery output increased by 0.1 million barrels per day.

On the basis of the high-level utilization of distillation capacity that prevailed for so many years, it appears that the current U.S. distillation capacity could accommodate a substantial increase in petroleum product demand. However, the National Petroleum Council estimated maximum output of motor gasoline by U.S. refineries by 1988 to average 6.8 million barrels per day.[14] U.S. refineries reached this limit in 1987; therefore, without expansion of U.S. refinery conversion and octane-enhancement processing capability, the spare distillation capacity by itself may not continue to yield enough motor gasoline for U.S. needs.

[14] National Petroleum Council, *U.S. Petroleum Refining*, (Washington, DC, October 1986), pp. 5, 6.

Summary Statistics

Table S1. Crude Oil[1] and Petroleum Products Overview

	Field Production			Stock Withdrawal[2]			Ending Stocks[3]
	Total Domestic[4]	Crude Oil	Natural Gas Plant Liquids	Crude Oil[5]	Petroleum Products	Petroleum Products Supplied	Crude Oil[5] and Petroleum Products
	Thousand Barrels per Day						Million Barrels
1973 Average	10,975	9,208	1,738	11	-146	17,308	1,008
1974 Average	10,498	8,774	1,688	-62	-117	16,653	[8] 1,074
1975 Average	10,045	8,375	1,633	[8] -17	[8] -15	16,322	1,133
1976 Average	9,774	8,132	1,603	-39	96	17,461	1,112
1977 Average	9,913	8,245	1,618	-170	-378	18,431	1,312
1978 Average	10,328	8,707	1,567	-78	172	18,847	1,278
1979 Average	10,179	8,552	1,584	-148	-25	18,513	1,341
1980 Average	10,214	8,597	1,573	-98	-42	17,056	[8] 1,392
1981 Average	10,230	8,572	1,609	[8] -290	[8] 130	16,058	1,484
1982 Average	10,252	8,649	1,550	-136	283	15,296	[8] 1,430
1983 Average	10,299	8,688	1,559	[8] -214	[8] 234	15,231	1,454
1984 Average	10,554	8,879	1,630	-199	-81	15,726	1,556
1985 January	10,412	8,740	1,628	76	1,351	16,109	1,512
February	10,692	9,025	1,623	425	1,347	16,121	1,462
March	10,748	9,095	1,600	-309	403	15,373	1,460
April	10,673	9,043	1,582	-520	56	15,472	1,473
May	10,770	9,132	1,594	-700	-399	15,504	1,508
June	10,664	9,022	1,597	264	-382	15,483	1,511
July	10,550	8,949	1,568	326	-496	15,434	1,516
August	10,485	8,803	1,594	159	568	16,060	1,494
September	10,584	8,954	1,575	-34	-255	15,099	1,502
October	10,637	8,970	1,610	98	124	15,944	1,496
November	10,640	8,902	1,660	-295	-634	15,503	1,523
December	10,777	9,030	1,680	-58	207	16,611	1,519
Average	10,636	8,971	1,609	-50	153	15,726	--
1986 January	10,911	9,137	1,711	-383	-151	16,088	1,535
February	10,916	9,173	1,696	-37	804	16,186	1,514
March	10,664	9,013	1,604	-345	1,160	16,276	1,489
April	10,435	8,864	1,573	41	262	15,945	1,479
May	10,440	8,838	1,543	260	-1,109	15,993	1,506
June	10,187	8,623	1,504	3	-1,238	16,049	1,543
July	10,225	8,660	1,507	-541	-422	16,307	1,573
August	9,875	8,374	1,445	242	-551	16,618	1,582
September	9,852	8,328	1,468	-217	-973	15,909	1,618
October	9,954	8,419	1,477	-233	476	16,602	1,610
November	10,061	8,412	1,569	95	-147	16,221	1,612
December	9,985	8,352	1,571	186	443	17,131	1,593
Average	10,289	8,680	1,551	-78	-124	15,281	--
1987 January	10,139	8,480	1,582	-166	376	16,584	1,586
February	10,073	8,389	1,618	-22	831	16,908	1,563
March	10,131	8,464	1,598	-125	340	16,165	1,557
April	10,139	8,498	1,590	50	532	16,524	1,539
May	9,977	8,336	1,585	36	-116	16,026	1,542
June	9,906	8,279	1,578	-165	-42	16,830	1,548
July	9,895	8,251	1,582	33	-372	17,113	1,558
August	9,843	8,210	1,571	-345	-737	16,346	1,592
September	9,851	8,205	1,582	-220	-236	16,670	1,606
October	10,037	8,364	1,602	-661	523	16,941	1,610
November	10,112	8,397	1,637	-355	-478	16,343	1,635
December	10,001	8,318	1,621	405	482	17,445	1,607
Average	10,008	8,349	1,595	-128	87	16,665	--

[1] Includes lease condensate.
[2] A negative number indicates an increase in stocks and a positive number indicates a decrease.
[3] Stocks are totals as of end of period.
[4] Includes crude oil, natural gas plant liquids, other hydrocarbons, and alcohol.
[5] Includes stocks located in the Strategic Petroleum Reserve.
[6] Includes crude oil for storage in the Strategic Petroleum Reserve.
[7] Net Imports equal Imports minus Exports.
[8] In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock withdrawal calculations. See Explanatory Note 8.

Footnotes continued on following page.

Table S1. Crude Oil[1] and Petroleum Products Overview (continued)

	Imports			Exports			
	Total	Crude Oil[6]	Petroleum Products	Total	Crude Oil	Petroleum Products	Net Imports[7]
	Thousand Barrels per Day						
1973 **Average**	**6,256**	**3,244**	**3,012**	**231**	**2**	**229**	**6,025**
1974 **Average**	**6,112**	**3,477**	**2,635**	**221**	**3**	**218**	**5,892**
1975 **Average**	**6,056**	**4,105**	**1,951**	**209**	**6**	**204**	**5,846**
1976 **Average**	**7,313**	**5,287**	**2,026**	**223**	**8**	**215**	**7,090**
1977 **Average**	**8,807**	**6,615**	**2,193**	**243**	**50**	**193**	**8,565**
1978 **Average**	**8,363**	**6,356**	**2,008**	**362**	**158**	**204**	**8,002**
1979 **Average**	**8,456**	**6,519**	**1,937**	**472**	**235**	**237**	**7,984**
1980 **Average**	**6,909**	**5,263**	**1,646**	**544**	**287**	**258**	**6,365**
1981 **Average**	**5,996**	**4,396**	**1,599**	**595**	**228**	**367**	**5,401**
1982 **Average**	**5,113**	**3,488**	**1,625**	**815**	**236**	**579**	**4,298**
1983 **Average**	**5,051**	**3,329**	**1,722**	**739**	**164**	**575**	**4,312**
1984 **Average**	**5,437**	**3,426**	**2,011**	**722**	**181**	**541**	**4,715**
1985 January	4,415	2,717	1,698	792	144	647	3,623
February	3,913	2,108	1,805	857	221	636	3,056
March	4,673	2,786	1,887	694	189	505	3,979
April	5,316	3,401	1,915	764	236	528	4,553
May	5,776	3,730	2,046	705	250	455	5,071
June	4,929	3,188	1,741	692	226	467	4,237
July	4,950	3,203	1,747	675	154	521	4,274
August	4,718	3,114	1,603	749	241	508	3,969
September	4,970	3,155	1,816	806	188	618	4,164
October	5,121	3,238	1,883	690	123	567	4,431
November	6,116	3,999	2,118	1,036	286	750	5,080
December	5,831	3,696	2,135	925	197	728	4,905
Average	**5,067**	**3,201**	**1,866**	**781**	**204**	**577**	**4,286**
1986 January	5,573	3,472	2,101	859	159	700	4,714
February	4,676	2,968	1,709	876	162	715	3,800
March	4,712	2,988	1,724	732	212	520	3,980
April	5,439	3,684	1,755	850	94	756	4,589
May	6,400	4,250	2,150	724	98	625	5,676
June	6,848	4,635	2,213	642	240	401	6,206
July	6,942	4,726	2,216	685	65	620	6,256
August	7,168	4,859	2,309	868	233	635	6,300
September	7,090	5,031	2,059	714	161	553	6,375
October	6,427	4,419	2,008	831	151	680	5,597
November	6,592	4,615	1,977	821	115	706	5,771
December	6,700	4,412	2,288	820	159	661	5,881
Average	**6,224**	**4,178**	**2,045**	**785**	**154**	**631**	**5,439**
1987 January	6,353	4,385	1,968	703	84	619	5,650
February	5,984	3,866	2,118	977	284	694	5,007
March	5,794	3,779	2,015	720	150	570	5,074
April	5,911	4,132	1,779	870	247	624	5,041
May	6,073	4,340	1,732	666	69	597	5,407
June	6,769	4,807	1,962	669	116	554	6,099
July	7,588	5,295	2,293	680	149	531	6,908
August	7,454	5,510	1,944	664	141	523	6,790
September	7,178	5,110	2,068	795	116	680	6,382
October	7,068	5,142	1,926	646	84	562	6,422
November	7,068	5,013	2,055	737	164	573	6,331
December	6,833	4,640	2,194	1,057	220	858	5,776
Average	**6,678**	**4,674**	**2,004**	**764**	**151**	**613**	**5,914**

Footnotes continued.
(s) = Less than 500 barrels per day.
Notes: Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.
Source: See the last page of this section.

Figure S1. Petroleum Overview

(Thousand Barrels per Day)

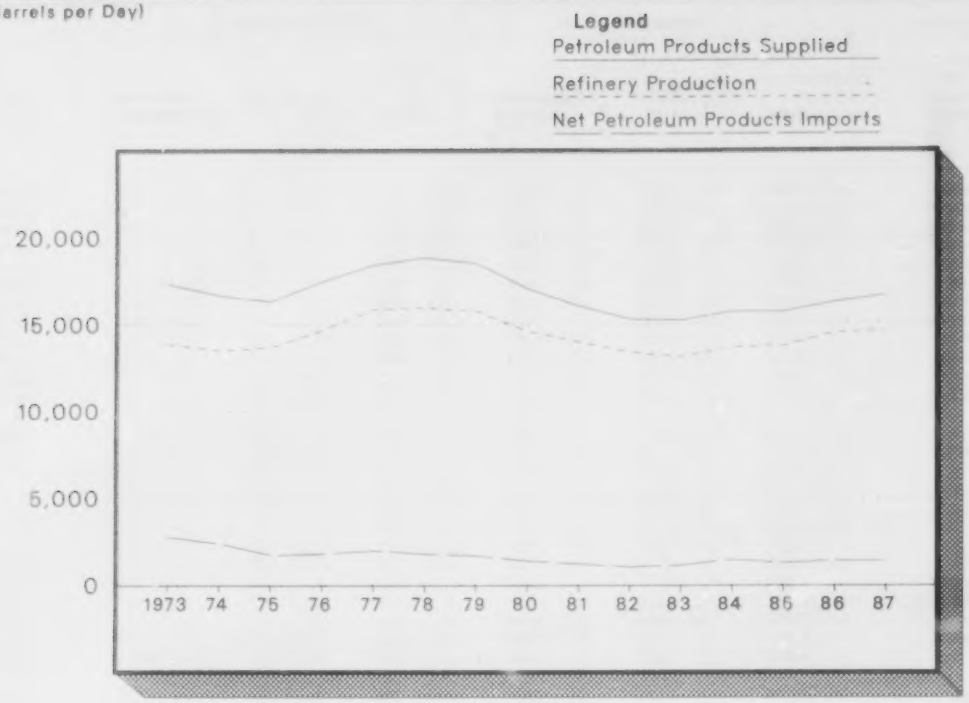


Figure S2. Petroleum Products Supplied

(Thousand Barrels per Day)

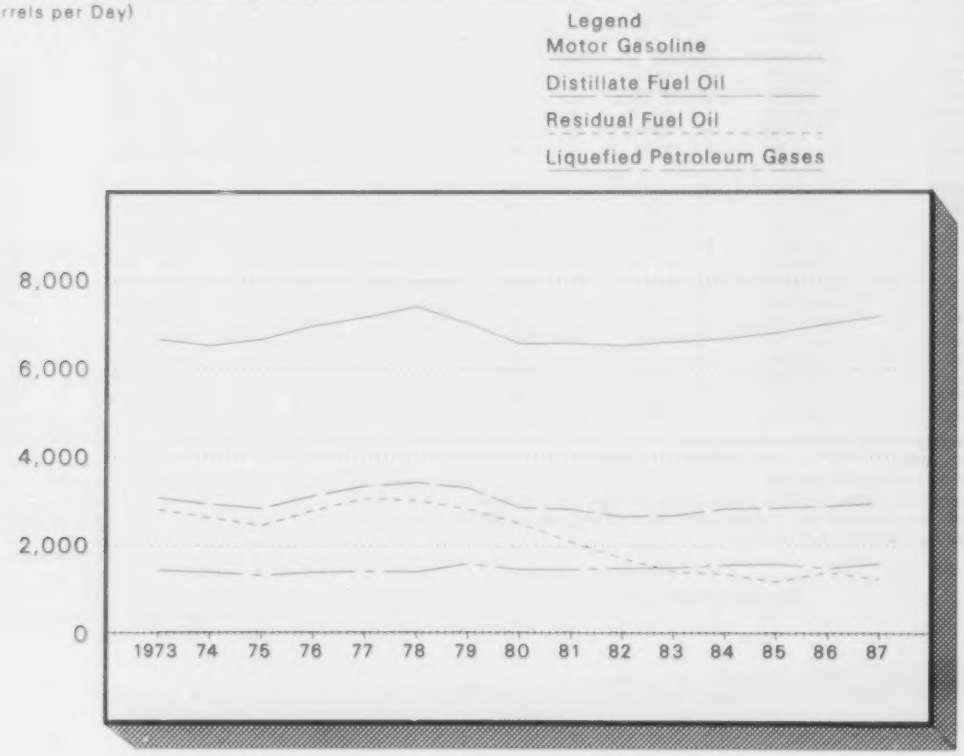


Figure S3. Crude Oil Supply and Disposition

(Thousand Barrels per Day)

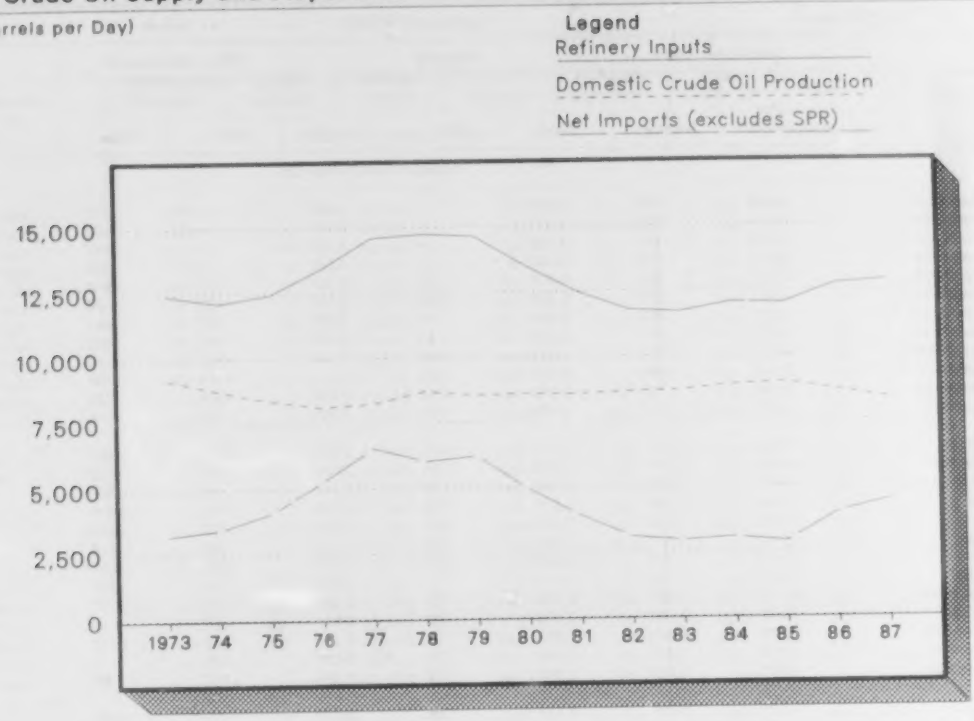


Figure S4. Crude Oil Ending Stocks

(Million Barrels)

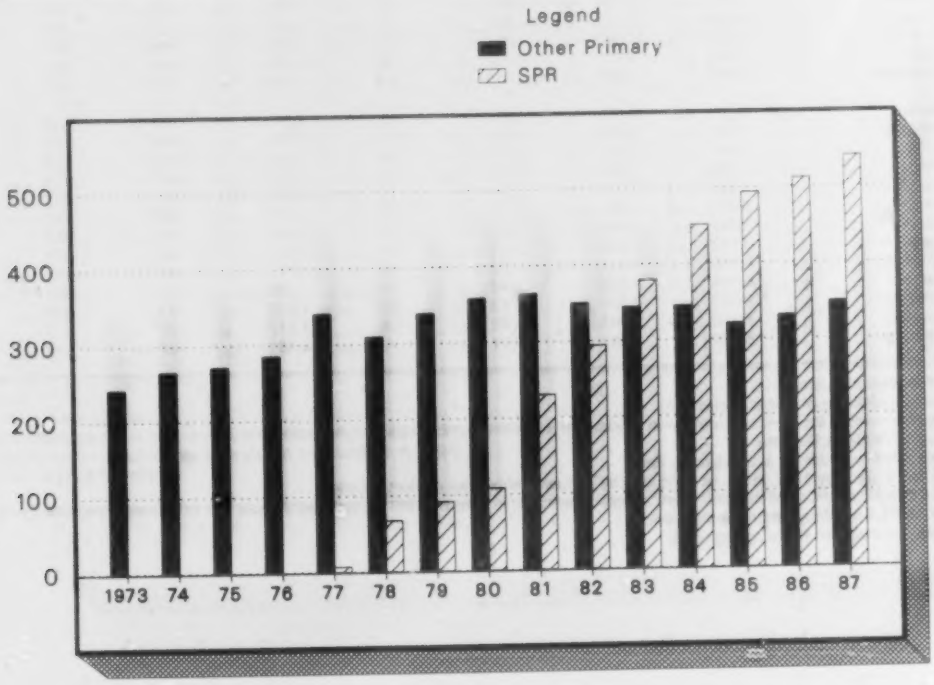


Table S2. Crude Oil[1] Supply and Disposition

	Supply							
	Field Production		Imports			Stock Withdrawal[2]		
	Total Domestic	Alaskan	Total	SPR[4]	Other	SPR[4]	Other	Unaccounted for Crude Oil[5]
	Thousand Barrels per Day							
1973 Average	9,208	198	3,244	--	3,244	--	11	3
1974 Average	8,774	193	3,477	--	3,477	--	-62	-25
1975 Average	8,375	191	4,105	--	4,105	--	-17	17
1976 Average	8,132	173	5,287	--	5,287	--	-30	77
1977 Average	8,245	464	6,615	21	6,594	-20	-150	-6
1978 Average	8,707	1,229	6,358	162	6,195	-163	84	-57
1979 Average	8,552	1,401	6,519	67	6,452	-67	-81	-11
1980 Average	8,597	1,617	5,263	44	5,219	-45	-52	34
1981 Average	8,572	1,609	4,396	256	4,141	-336	[7] 46	83
1982 Average	8,649	1,696	3,488	165	3,323	-174	38	71
1983 Average	8,688	1,714	3,329	234	3,096	-234	[7] 20	114
1984 Average	8,879	1,722	3,426	197	3,229	-195	-4	185
1985 January	8,740	1,647	2,717	223	2,494	-223	298	122
February	9,025	1,877	2,108	98	2,010	-97	522	94
March	9,095	1,866	2,786	48	2,738	-48	-262	59
April	9,043	1,784	3,401	108	3,293	-111	-409	183
May	9,132	1,888	3,730	222	3,508	-225	-475	247
June	9,022	1,871	3,188	155	3,034	-155	419	100
July	8,949	1,809	3,203	226	2,977	-225	551	177
August	8,803	1,795	3,114	116	2,999	-116	274	267
September	8,954	1,867	3,155	71	3,084	-71	37	93
October	8,970	1,850	3,238	20	3,218	-20	119	81
November	8,902	1,804	3,999	53	3,946	-53	-242	150
December	9,030	1,852	3,696	74	3,621	-60	2	164
Average	8,971	1,825	3,201	118	3,083	-117	67	145
1986 January	9,137	1,870	3,472	51	3,420	-35	-348	364
February	9,173	1,907	2,968	24	2,944	-35	-2	32
March	9,013	1,860	2,988	59	2,929	-49	-296	259
April	8,864	1,836	3,684	63	3,621	-63	104	70
May	8,838	1,927	4,250	36	4,215	-35	295	79
June	8,623	1,887	4,635	64	4,571	-64	66	292
July	8,660	1,903	4,726	52	4,674	-52	-489	189
August	8,374	1,811	4,859	51	4,809	-51	293	93
September	8,328	1,782	5,031	47	4,984	-47	-170	161
October	8,419	1,927	4,419	37	4,382	-36	-197	223
November	8,412	1,883	4,615	45	4,570	-65	160	-136
December	8,352	1,807	4,412	48	4,365	-68	254	28
Average	8,680	1,867	4,178	48	4,130	-50	-28	139
1987 January	8,480	2,019	4,385	92	4,293	-108	-58	-5
February	8,389	1,853	3,866	44	3,822	-64	42	382
March	8,464	1,968	3,779	95	3,684	-106	-19	151
April	8,498	1,990	4,132	57	4,076	-67	116	120
May	8,336	1,979	4,340	92	4,248	-101	137	51
June	8,279	1,930	4,807	64	4,743	-69	-97	434
July	8,251	1,910	5,295	76	5,218	-91	124	32
August	8,210	1,908	5,510	63	5,447	-63	-281	177
September	8,205	1,874	5,110	64	5,047	-64	-157	217
October	8,364	1,986	5,142	57	5,085	-57	-604	-3
November	8,397	2,068	5,013	97	4,916	-97	-258	115
December	8,318	2,043	4,640	68	4,572	-68	472	101
Average	8,349	1,962	4,674	73	4,601	-80	-49	145

[1] Includes lease condensate.
[2] Stocks are totals as of end of period.
[3] A negative number indicates an increase in stocks and a positive number indicates a decrease.
[4] Strategic Petroleum Reserve.
[5] Unaccounted for crude oil is a balancing item.
[6] Beginning in January 1983, crude oil used directly as fuel is shown as product supplied.
[7] Stocks of Alaskan crude oil in transit were included beginning in January 1981. Stock withdrawals are calculated using new basis stock levels. See Explanatory Notes 8 and 9.

Footnotes continued on following page.

Table S2. Crude Oil[1] Supply and Disposition (continued)

	Supply	Disposition				Ending Stocks[2]		
	Crude Used Directly[6]	Crude Losses	Refinery Inputs	Exports	Products Supplied[6]	Total Crude Oil	SPR[4]	Other Primary
	Thousand Barrels per Day					Million Barrels		
1973 Average	-19	13	12,431	2	--	242	--	242
1974 Average	-15	13	12,133	3	--	265	--	265
1975 Average	-17	13	12,442	6	--	271	--	271
1976 Average	-18	15	13,416	8	--	285	--	285
1977 Average	-14	16	14,602	50	--	348	7	340
1978 Average	-14	16	14,739	158	--	376	67	309
1979 Average	-13	16	14,648	235	--	430	91	339
1980 Average	-13	15	13,481	287	--	[7] 466	108	[7] 358
1981 Average	-58	5	12,470	228	--	594	230	363
1982 Average	-59	3	11,774	236	--	[7] 644	294	350
1983 Average	--	2	11,685	164	66	723	379	344
1984 Average	--	2	12,044	181	64	796	451	345
1985 January	--	1	11,445	144	63	794	457	336
February	--	1	11,367	221	63	782	460	322
March	--	1	11,372	189	69	791	462	330
April	--	1	11,805	236	67	807	465	342
May	--	1	12,094	250	65	829	472	357
June	--	1	12,292	226	56	821	477	344
July	--	1	12,445	154	55	811	484	327
August	--	(s)	12,045	241	55	806	487	318
September	--	(s)	11,925	188	55	807	489	317
October	--	(s)	12,209	123	55	804	490	314
November	--	(s)	12,410	286	59	812	491	321
December	--	1	12,570	197	63	814	493	321
Average	--	**1**	**12,002**	**204**	**60**	--	--	--
1986 January	--	1	12,374	159	57	826	494	332
February	--	(s)	11,918	162	56	827	495	332
March	--	(s)	11,652	212	52	838	497	341
April	--	(s)	12,512	94	51	837	499	338
May	--	(s)	13,279	98	49	829	500	329
June	--	(s)	13,261	240	52	828	502	327
July	--	(s)	12,917	65	51	845	503	342
August	--	(s)	13,287	223	48	838	505	333
September	--	(s)	12,997	161	45	844	506	338
October	--	(s)	12,536	151	41	851	508	344
November	--	(s)	12,831	115	41	849	509	339
December	--	(s)	12,777	159	42	843	512	331
Average	--	**(s)**	**12,716**	**154**	**49**	--	--	--
1987 January	--	1	12,570	84	41	848	515	333
February	--	(s)	12,290	284	41	849	517	332
March	--	1	12,081	150	39	852	520	332
April	--	(s)	12,512	247	41	851	522	329
May	--	(s)	12,653	69	42	850	525	325
June	--	(s)	13,202	116	36	855	527	328
July	--	(s)	13,430	149	32	854	530	324
August	--	(s)	13,380	141	31	864	532	332
September	--	(s)	13,168	116	28	871	534	337
October	--	(s)	12,733	84	25	892	536	356
November	--	(s)	12,981	164	25	902	539	364
December	--	(s)	13,212	220	31	890	541	349
Average	--	**(s)**	**12,854**	**151**	**34**	--	--	--

Footnotes continued.
(s) = Less than 500 barrels per day.
Notes: Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.
Source: See the last page of this section.

Table S3. Crude Oil and Petroleum Product Imports

	Imports from OPEC Sources[1]										
	Algeria	Libya	Saudi Arabia	United Arab Emirates	Indonesia	Iran	Nigeria	Venezuela	Other OPEC[2]	Total OPEC[3]	Total Arab OPEC[4]
	Thousand Barrels per Day										
1973 Average	136	164	486	71	213	223	459	1,135	106	2,993	915
1974 Average	190	4	461	74	300	469	713	979	88	3,280	752
1975 Average	282	232	715	117	390	280	762	702	122	3,601	1,383
1976 Average	432	453	1,230	254	539	298	1,025	700	134	5,066	2,424
1977 Average	559	723	1,380	335	541	535	1,143	690	287	6,193	3,185
1978 Average	649	654	1,144	385	573	555	919	645	226	5,751	2,963
1979 Average	636	658	1,356	281	420	304	1,080	690	212	5,637	3,056
1980 Average	488	554	1,261	172	348	9	857	481	130	4,300	2,551
1981 Average	311	319	1,129	81	366	0	620	406	90	3,323	1,848
1982 Average	170	26	552	92	248	35	514	412	97	2,146	854
1983 Average	240	0	337	30	338	48	302	422	144	1,862	632
1984 Average	323	1	325	117	343	10	216	548	166	2,049	819
1985 January	112	0	106	60	296	0	262	481	89	1,405	305
February	174	0	108	0	232	0	119	524	64	1,220	307
March	247	0	85	52	283	0	164	588	84	1,505	385
April	286	8	201	70	313	0	280	684	86	1,928	575
May	255	0	41	128	265	0	381	552	354	1,976	635
June	178	5	26	81	438	0	357	452	152	1,690	378
July	125	10	44	13	390	42	381	573	248	1,825	286
August	135	0	46	17	377	100	207	568	289	1,740	280
September	147	0	27	57	206	43	285	808	230	1,802	302
October	177	20	251	17	277	41	305	676	196	1,958	520
November	164	11	430	34	356	99	325	727	294	2,440	752
December	244	0	642	15	324	0	432	625	149	2,430	925
Average	**187**	**4**	**168**	**45**	**314**	**27**	**293**	**605**	**187**	**1,830**	**472**
1986 January	215	0	664	11	290	0	278	629	210	2,298	976
February	157	0	574	0	290	(s)	204	518	64	1,807	757
March	260	0	482	0	161	0	328	797	117	2,145	798
April	275	0	698	21	292	0	319	831	139	2,576	1,058
May	193	0	574	40	314	40	398	899	290	2,749	966
June	319	0	662	83	353	0	382	772	439	3,010	1,377
July	310	0	738	59	532	66	542	730	330	3,307	1,357
August	363	0	680	37	274	93	606	916	378	3,346	1,339
September	245	0	810	62	341	31	684	856	356	3,383	1,388
October	305	0	697	147	388	0	530	863	346	3,276	1,387
November	311	0	868	34	335	0	483	843	214	3,088	1,295
December	291	0	769	30	251	0	511	841	284	2,976	1,223
Average	**271**	**0**	**685**	**41**	**318**	**19**	**440**	**793**	**265**	**2,837**	**1,162**
1987 January	156	0	875	15	254	0	346	899	218	2,764	1,184
February	307	0	776	54	418	30	256	791	155	2,785	1,222
March	334	0	430	0	317	73	312	702	135	2,305	843
April	323	0	463	62	236	47	512	710	77	2,430	866
May	196	0	499	26	297	75	550	913	119	2,675	775
June	247	0	782	45	261	165	546	808	268	3,122	1,275
July	347	0	756	42	349	237	792	854	157	3,533	1,264
August	250	0	961	103	312	208	732	831	351	3,748	1,611
September	378	0	902	146	242	193	615	821	263	3,560	1,640
October	274	0	1,051	111	305	86	518	829	401	3,576	1,713
November	395	0	637	97	219	41	607	771	402	3,169	1,477
December	339	0	876	31	216	23	613	717	220	3,033	1,415
Average	**295**	**0**	**751**	**61**	**285**	**96**	**535**	**804**	**231**	**3,060**	**1,274**

[1] Excludes petroleum imported into the United States indirectly from members of the Organization of Petroleum Exporting Countries(OPEC), primarily from Caribbean and West European areas, as petroleum products that were refined from crude oil produced by OPEC.
[2] The other members of OPEC are Ecuador, Gabon, Iraq, Kuwait, and Qatar.
[3] "Total OPEC" consists of Ecuador, Gabon, Indonesia, Iran, Nigeria, and Venezuela, as well as the Arab members.
[4] The Arab members of OPEC are Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and the United Arab Emirates.
Footnotes continued on following page.

Table S3. Crude Oil and Petroleum Product Imports (continued)

		Imports from Non-OPEC Sources [5]										Total Imports
		Bahamas	Canada	Mexico	Netherlands Antilles	Trinidad and Tobago	United Kingdom	Puerto Rico	Virgin Islands	Other Non-OPEC	Total Non-OPEC	
		Thousand Barrels per day										
1973	**Average**	**174**	**1,325**	**16**	**585**	**255**	**15**	**99**	**329**	**465**	**3,263**	**6,256**
1974	**Average**	**164**	**1,070**	**8**	**511**	**251**	**8**	**90**	**391**	**340**	**2,832**	**6,112**
1975	**Average**	**152**	**846**	**71**	**332**	**242**	**14**	**90**	**406**	**300**	**2,454**	**6,056**
1976	**Average**	**118**	**599**	**87**	**275**	**274**	**31**	**88**	**422**	**353**	**2,247**	**7,313**
1977	**Average**	**171**	**517**	**179**	**211**	**289**	**126**	**105**	**466**	**550**	**2,614**	**8,807**
1978	**Average**	**160**	**467**	**318**	**229**	**253**	**180**	**94**	**429**	**484**	**2,613**	**8,363**
1979	**Average**	**147**	**538**	**439**	**231**	**190**	**202**	**92**	**431**	**548**	**2,819**	**8,456**
1980	**Average**	**78**	**455**	**533**	**225**	**176**	**176**	**88**	**388**	**491**	**2,609**	**6,909**
1981	**Average**	**74**	**447**	**522**	**197**	**133**	**375**	**62**	**327**	**534**	**2,672**	**5,996**
1982	**Average**	**65**	**482**	**685**	**175**	**112**	**456**	**50**	**316**	**627**	**2,968**	**5,113**
1983	**Average**	**125**	**547**	**826**	**189**	**96**	**382**	**40**	**282**	**701**	**3,189**	**5,051**
1984	**Average**	**88**	**630**	**748**	**188**	**94**	**402**	**42**	**294**	**902**	**3,388**	**5,437**
1985	January	92	616	767	132	113	345	32	235	678	3,010	4,415
	February	37	730	852	52	119	151	50	213	689	2,693	3,913
	March	36	909	923	49	115	133	29	235	739	3,168	4,673
	April	4	890	950	18	107	213	42	205	959	3,388	5,316
	May	74	823	929	28	126	419	37	252	1,112	3,800	5,776
	June	24	720	726	30	92	481	23	271	872	3,240	4,929
	July	38	610	814	36	133	324	14	236	918	3,124	4,950
	August	11	664	859	18	121	336	28	241	699	2,978	4,718
	September	47	783	852	40	129	303	26	173	815	3,169	4,970
	October	35	825	745	5	99	352	21	260	821	3,163	5,121
	November	22	766	887	30	100	376	26	325	1,143	3,676	6,116
	December	54	902	676	44	96	273	12	314	1,029	3,400	5,831
	Average	**40**	**770**	**816**	**40**	**113**	**310**	**28**	**247**	**873**	**3,237**	**5,067**
1986	January	62	823	681	58	108	333	21	326	862	3,275	5,573
	February	33	690	557	11	85	218	18	309	949	2,870	4,676
	March	18	750	616	27	79	178	25	186	688	2,567	4,712
	April	34	798	694	13	111	188	23	209	793	2,863	5,439
	May	32	881	743	37	130	365	27	237	1,199	3,651	6,400
	June	29	753	884	17	167	569	30	233	1,157	3,838	6,848
	July	44	763	850	25	131	353	29	237	1,202	3,634	6,942
	August	39	801	738	12	133	584	7	214	1,294	3,822	7,168
	September	15	801	615	17	162	437	23	291	1,345	3,706	7,090
	October	38	842	680	26	112	173	21	215	1,043	3,151	6,427
	November	39	960	565	53	129	448	21	179	1,111	3,504	6,592
	December	57	809	746	7	148	351	12	291	1,304	3,724	6,700
	Average	**37**	**807**	**699**	**25**	**125**	**350**	**21**	**244**	**1,080**	**3,387**	**6,224**
1987	January	59	799	689	29	100	384	33	327	1,170	3,589	6,353
	February	56	783	692	23	127	260	24	296	938	3,199	5,984
	March	43	738	721	14	124	322	17	247	1,262	3,489	5,794
	April	43	818	679	12	123	485	24	259	1,037	3,481	5,911
	May	31	884	541	33	117	392	21	214	1,164	3,398	6,073
	June	22	912	664	13	114	377	21	281	1,242	3,646	6,769
	July	46	901	680	71	98	354	17	288	1,598	4,055	7,588
	August	27	841	577	51	100	289	20	274	1,526	3,706	7,454
	September	48	846	705	42	105	259	25	271	1,318	3,618	7,178
	October	26	938	697	16	68	321	17	250	1,138	3,492	7,068
	November	31	827	627	14	111	456	15	235	1,585	3,899	7,068
	December	10	883	591	24	73	324	23	327	1,543	3,800	6,833
	Average	**37**	**848**	**655**	**29**	**106**	**352**	**21**	**272**	**1,296**	**3,617**	**6,678**

Footnotes continued.

[5] Includes petroleum imported into the United States indirectly from members of OPEC, primarily from Caribbean and West European areas, as petroleum products that were refined from crude oil produced by OPEC.

(s) = Less than 500 barrels per day.

Notes: Beginning in October 1977, Strategic Petroleum Reserve imports are included.
Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.

Source: See the last page of this section.

Figure S5. Finished Motor Gasoline Supply and Disposition

(Thousand Barrels per Day)

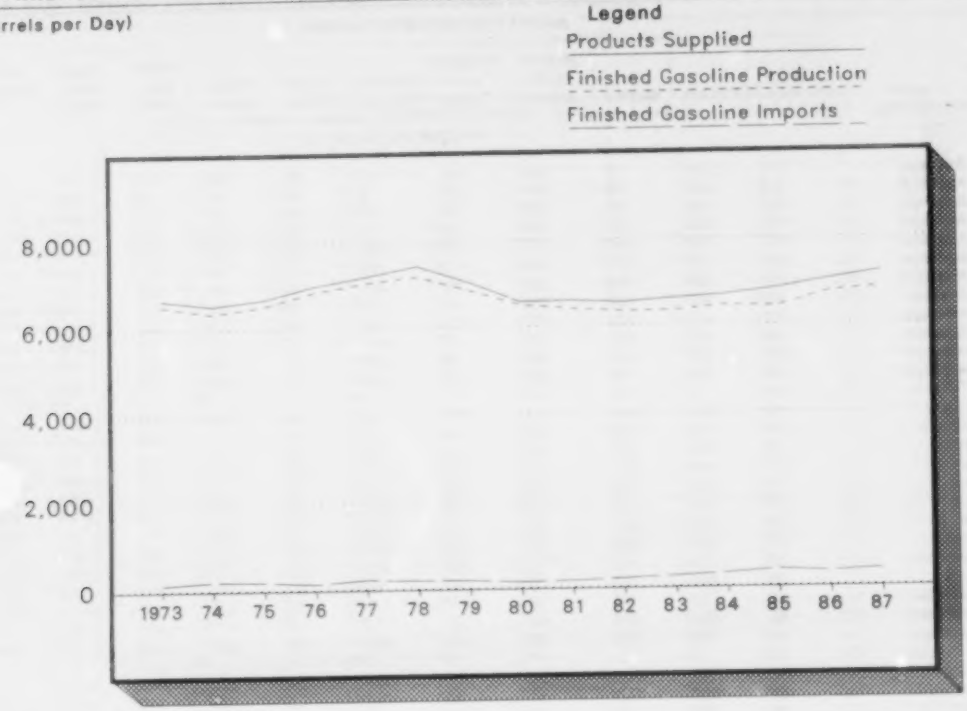
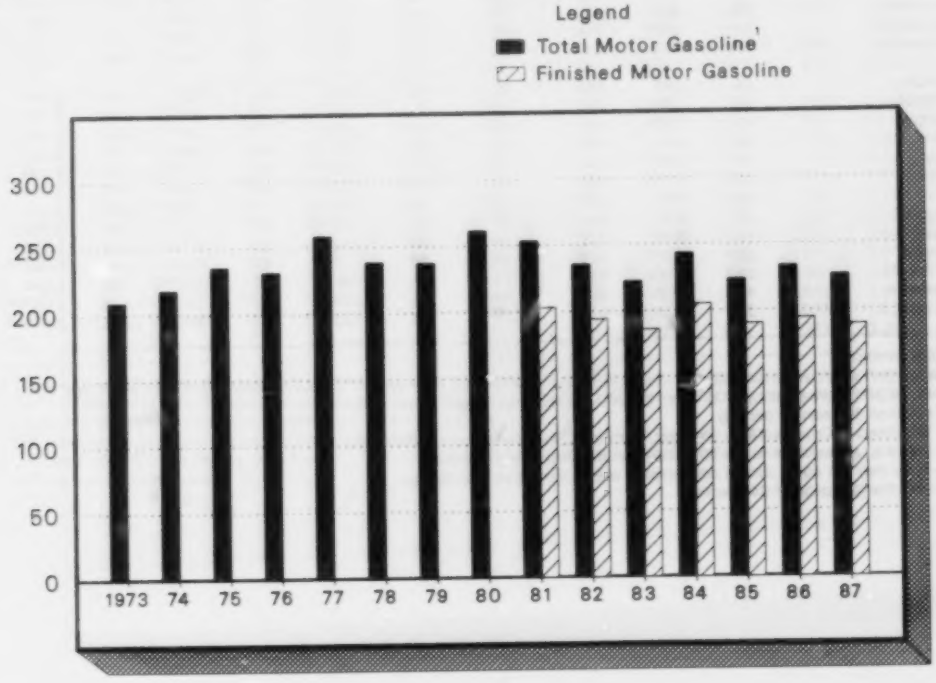


Figure S6. Motor Gasoline Ending Stocks

(Million Barrels)



[1]Includes finished motor gasoline and gasoline blending components.

Table S4. Finished Motor Gasoline Supply and Disposition

	Supply			Disposition				Ending Stocks[1]	
					Products Supplied				
	Total Production	Imports[2]	Stock Withdrawal[2,3]	Exports	Total[4]	Unleaded	Unleaded	Total Motor Gasoline[5]	Finished Motor Gasoline
	Thousand Barrels per Day						Percent of Total	Million Barrels	
1973 Average	6,535	134	9	4	6,674	--	--	209	--
1974 Average	6,360	204	-24	2	6,537	--	--	[6] 218	--
1975 Average	6,520	184	[6] -28	2	6,675	--	--	235	--
1976 Average	6,841	131	10	3	6,978	--	--	231	--
1977 Average	7,033	217	-72	2	7,177	1,976	27.5	258	--
1978 Average	7,169	190	54	1	7,412	2,521	34.0	238	--
1979 Average	6,852	181	2	(s)	7,034	2,798	39.8	237	--
1980 Average	6,506	140	-66	1	6,579	3,067	46.6	[6] 261	--
1981 Average[7]	6,405	157	[6] 28	2	6,588	3,264	49.5	253	--
1982 Average	6,338	197	25	20	6,539	3,409	52.1	[6] 235	--
1983 Average	6,340	247	[6] 45	10	6,622	3,647	55.1	222	186
1984 Average	6,453	299	-54	6	6,693	3,987	59.6	243	205
1985 January	5,926	204	220	2	6,348	4,016	63.3	234	198
February	5,914	348	327	2	6,587	4,126	62.6	225	189
March	6,072	481	115	3	6,664	4,202	63.1	219	186
April	6,344	494	128	11	6,956	4,396	63.2	215	182
May	6,564	480	23	8	7,060	4,445	63.0	215	181
June	6,780	396	-172	7	6,997	4,482	64.1	218	186
July	6,788	426	-188	18	7,008	4,545	64.8	226	192
August	6,814	305	127	4	7,242	4,755	65.7	222	188
September	6,299	314	22	6	6,629	4,357	65.7	223	187
October	6,356	324	235	19	6,897	4,485	65.0	214	180
November	6,480	410	-104	17	6,770	4,477	66.1	217	183
December	6,651	386	-227	18	6,792	4,561	67.2	223	190
Average	**6,419**	**381**	**41**	**10**	**6,831**	**4,406**	**64.5**	--	--
1986 January	6,522	332	-347	6	6,502	4,404	67.7	238	201
February	6,302	334	-156	11	6,469	4,365	67.5	244	205
March	6,061	224	691	21	6,955	4,678	67.3	219	184
April	6,438	291	338	23	7,105	4,783	67.3	207	174
May	7,095	471	-450	9	7,106	4,729	66.5	221	188
June	7,101	392	-265	18	7,209	4,914	68.2	230	196
July	6,956	337	189	47	7,436	5,182	69.7	224	190
August	7,092	303	83	43	7,435	5,138	69.1	222	187
September	6,891	303	-289	40	6,864	4,813	70.1	234	196
October	6,616	322	372	61	7,250	5,086	70.1	222	184
November	6,895	280	-200	96	6,879	4,918	71.5	229	190
December	6,970	320	-122	24	7,143	5,193	72.7	233	194
Average	**6,752**	**326**	**-11**	**33**	**7,034**	**4,854**	**69.0**	--	--
1987 January	6,714	393	-528	44	6,535	4,822	73.8	251	211
February	6,365	309	144	22	6,796	5,068	74.6	250	207
March	6,569	364	51	20	6,964	5,193	74.6	248	205
April	6,850	374	133	42	7,314	5,405	73.9	242	201
May	6,991	354	164	48	7,460	5,569	74.7	235	196
June	7,089	385	111	45	7,539	5,678	75.3	230	193
July	7,043	452	119	33	7,581	5,740	75.7	226	189
August	6,933	396	29	19	7,338	5,656	77.1	226	188
September	6,921	421	-107	30	7,205	5,536	76.8	230	191
October	6,668	356	302	21	7,305	5,636	77.1	218	182
November	6,907	484	-208	32	7,151	5,589	78.2	225	188
December	7,015	320	-24	59	7,251	5,715	78.8	226	189
Average	**6,841**	**384**	**15**	**35**	**7,206**	**5,470**	**75.9**	--	--

[1] Stocks are totals as of end of period.
[2] Beginning in 1981, excludes blending components.
[3] A negative number indicates an increase in stocks and a positive number indicates a decrease.
[4] Includes gasohol.
[5] Includes motor gasoline blending components.
[6] In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock withdrawal calculations. See Explanatory Note 8.
[7] Beginning in January 1981, survey forms were modified. See Explanatory Note 10.
(s) = Less than 500 barrels per day.
Notes: Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.
Source: See the last page of this section.

Figure S7. Distillate Fuel Oil Supply and Disposition

(Thousand Barrels per Day)

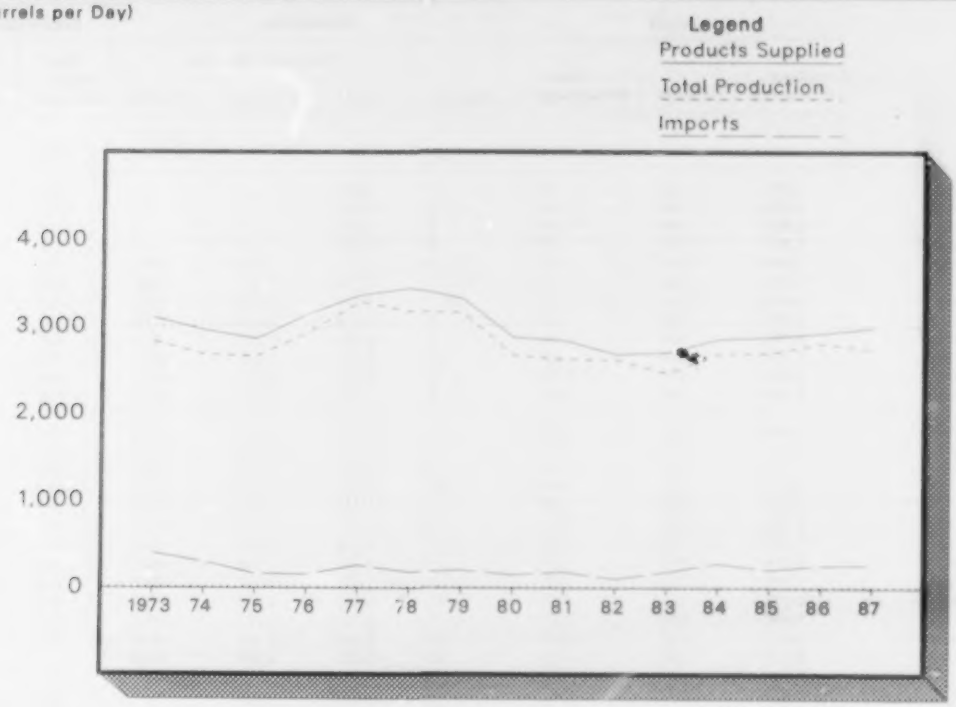


Figure S8. Distillate Fuel Oil Ending Stocks

(Million Barrels)

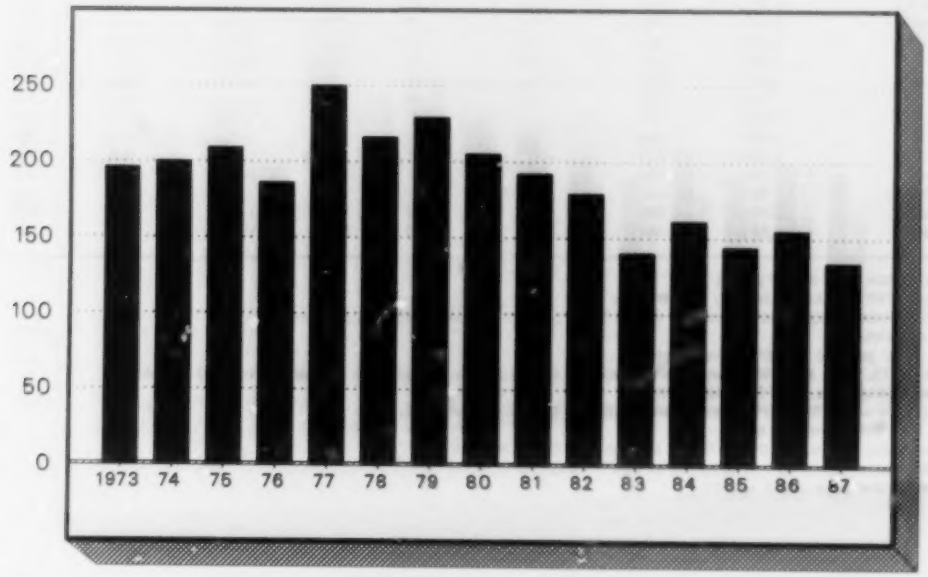


Table S5. Distillate Fuel Oil Supply and Disposition

	Supply				Disposition		Ending Stocks[1]
	Total Production	Imports	Stock Withdrawal[2]	Crude Used Directly[3]	Exports	Products Supplied[3]	
	Thousand Barrels per Day						Million Barrels
1973 Average	**2,822**	**392**	**-115**	**2**	**9**	**3,092**	196
1974 Average	**2,669**	**289**	**-9**	**2**	**2**	**2,948**	[4] 200
1975 Average	**2,654**	**155**	[4] **40**	**2**	**1**	**2,851**	209
1976 Average	**2,924**	**146**	**62**	**1**	**1**	**3,133**	186
1977 Average	**3,278**	**250**	**-176**	**1**	**1**	**3,352**	250
1978 Average	**3,167**	**173**	**93**	**1**	**3**	**3,432**	216
1979 Average	**3,153**	**193**	**-34**	**1**	**3**	**3,311**	229
1980 Average	**2,662**	**142**	**64**	**1**	**3**	**2,866**	[4] 205
1981 Average[5]	**2,613**	**173**	[4] **38**	**10**	**5**	**2,829**	192
1982 Average	**2,606**	**93**	**35**	**10**	**74**	**2,671**	[4] 179
1983 Average	**2,456**	**174**	[4] **124**	**--**	**64**	**2,600**	140
1984 Average	**2,681**	**272**	**-57**	**--**	**51**	**2,845**	161
1985 January	2,631	272	603	--	41	3,465	142
February	2,504	143	748	--	64	3,330	121
March	2,267	156	714	--	44	3,093	99
April	2,490	253	82	--	27	2,798	97
May	2,686	197	-245	--	31	2,607	104
June	2,647	152	-175	--	30	2,594	110
July	2,646	95	-193	--	112	2,436	116
August	2,592	81	62	--	100	2,636	114
September	2,594	222	-120	--	121	2,575	117
October	2,902	262	-195	--	67	2,901	123
November	3,102	280	-543	--	92	2,747	140
December	3,176	287	-128	--	81	3,254	144
Average	**2,687**	**200**	**48**	**--**	**67**	**2,868**	--
1986 January	2,899	325	232	--	126	3,330	136
February	2,563	169	860	--	176	3,416	112
March	2,643	217	438	--	131	3,168	99
April	2,788	147	97	--	128	2,904	96
May	2,858	149	-95	--	149	2,762	99
June	2,729	169	-301	--	53	2,544	108
July	2,710	313	-355	--	75	2,592	119
August	2,922	370	-607	--	64	2,621	138
September	2,865	262	-489	--	98	2,540	152
October	2,717	243	25	--	74	2,912	152
November	2,917	254	-222	--	72	2,877	158
December	2,943	339	102	--	55	3,329	155
Average	**2,798**	**247**	**-31**	**--**	**100**	**2,914**	--
1987 January	2,759	222	444	--	115	3,310	141
February	2,556	253	629	--	93	3,345	124
March	2,421	297	464	--	67	3,116	109
April	2,553	192	300	--	53	2,991	100
May	2,563	203	-31	--	51	2,684	101
June	2,689	265	-104	--	61	2,790	104
July	2,700	381	-329	--	38	2,713	115
August	2,706	222	-327	--	47	2,553	125
September	2,748	222	-68	--	64	2,838	127
October	2,780	237	187	--	53	3,151	121
November	3,035	187	-234	--	56	2,932	128
December	3,242	378	-209	--	92	3,318	134
Average	**2,731**	**256**	**96**	**--**	**66**	**2,976**	--

[1] Stocks are totals as of end of period.
[2] A negative number indicates an increase in stocks and a positive number indicates a decrease.
[3] Beginning in January 1983, product supplied for distillate fuel oil does not include crude oil used directly. See Explanatory Note 4.
[4] In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock withdrawal calculations. See Explanatory Note 8.
[5] Beginning in January 1981, survey forms were modified. See Explanatory Note 10.

Notes: Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.
Source: See the last page of this section.

Figure S9. Residual Fuel Oil Supply and Disposition

(Thousand Barrels per Day)

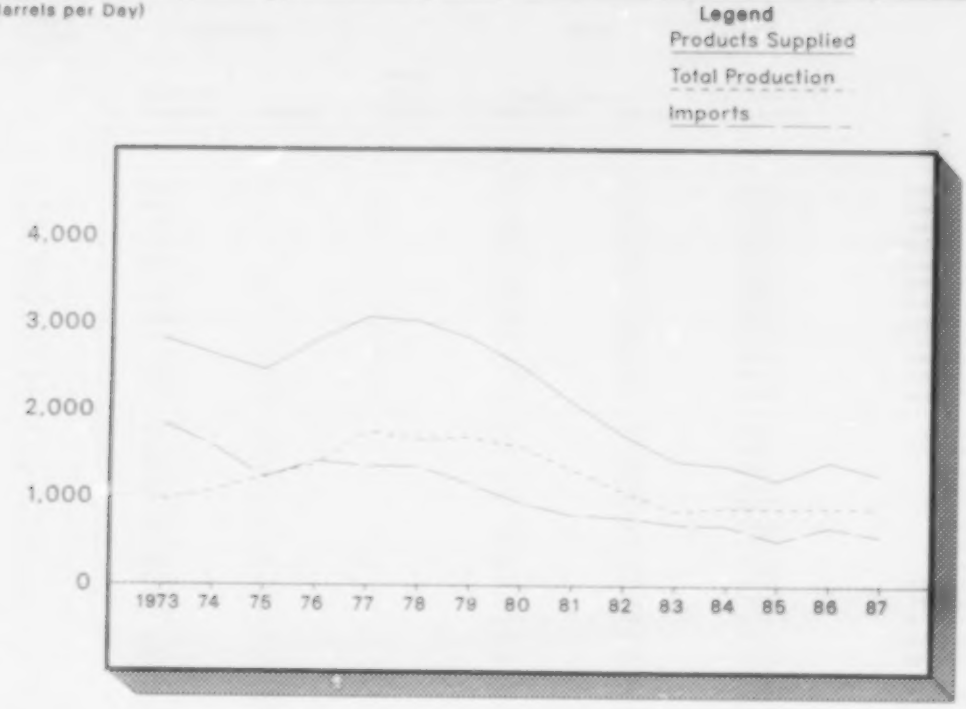


Figure S10. Residual Fuel Oil Ending Stocks

(Million Barrels)

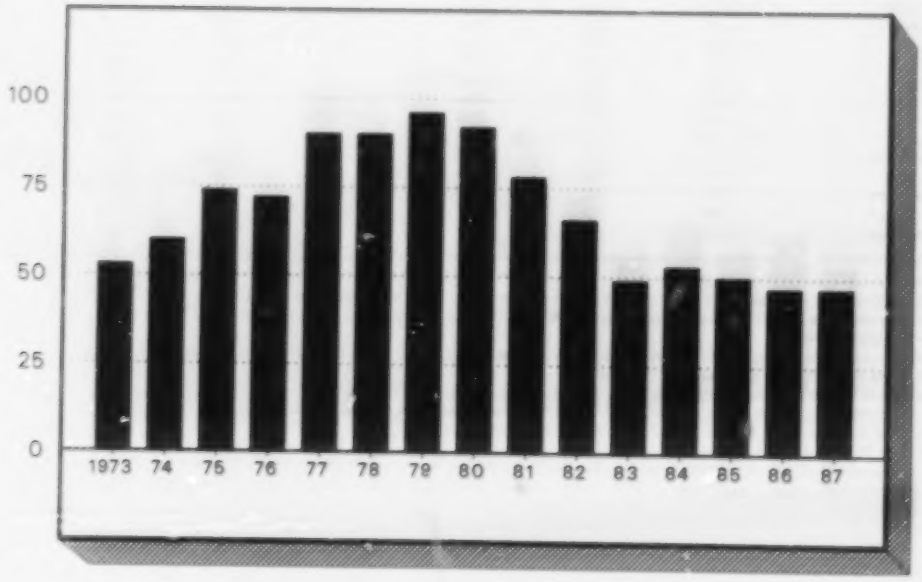


Table S6. Residual Fuel Oil Supply and Disposition

	Supply				Disposition		Ending Stocks[1]
	Total Production	Imports	Stock Withdrawal[2]	Crude Used Directly[3]	Exports	Products Supplied[3]	
	Thousand Barrels per Day						Million Barrels
1973 Average	971	1,853	5	17	23	2,822	53
1974 Average	1,070	1,587	-17	13	14	2,639	[4] 60
1975 Average	1,235	1,223	[4] 2	15	15	2,462	74
1976 Average	1,377	1,413	5	17	12	2,801	72
1977 Average	1,754	1,359	-48	13	6	3,071	90
1978 Average	1,687	1,355	-1	13	13	3,023	90
1979 Average	1,687	1,151	-15	12	9	2,826	96
1980 Average	1,580	939	10	12	33	2,508	[4] 92
1981 Average[5]	1,321	800	[4] 37	48	118	2,088	78
1982 Average	1,070	776	32	48	209	1,716	[4] 66
1983 Average	852	599	[4] 55	--	185	1,421	49
1984 Average	891	681	-12	--	190	1,369	53
1985 January	1,004	568	219	--	312	1,480	46
February	1,040	580	41	--	295	1,366	45
March	963	477	-35	--	216	1,190	46
April	912	383	-2	--	167	1,126	46
May	793	394	155	--	185	1,156	41
June	702	400	59	--	118	1,043	40
July	732	437	-29	--	83	1,058	41
August	742	424	108	--	106	1,168	37
September	808	617	-207	--	188	1,031	43
October	912	541	-228	--	184	1,042	50
November	932	627	5	--	275	1,290	50
December	1,055	681	-4	--	250	1,483	50
Average	882	510	7	--	197	1,202	--
1986 January	940	622	56	--	211	1,407	49
February	856	604	200	--	183	1,478	43
March	813	626	108	--	113	1,435	40
April	933	545	127	--	202	1,402	36
May	913	675	-114	--	129	1,345	39
June	818	712	-111	--	43	1,377	43
July	850	673	75	--	90	1,508	40
August	896	793	-29	--	171	1,485	41
September	854	641	-89	--	110	1,296	44
October	827	635	-59	--	144	1,259	46
November	975	574	-15	--	143	1,391	46
December	987	913	-37	--	224	1,638	47
Average	889	669	8	--	147	1,418	--
1987 January	920	701	81	--	198	1,504	45
February	825	668	243	--	221	1,515	38
March	863	559	-38	--	150	1,234	39
April	831	476	114	--	239	1,182	36
May	813	505	-145	--	144	1,029	40
June	864	481	-33	--	105	1,207	41
July	901	721	-108	--	175	1,339	45
August	882	512	-32	--	185	1,176	46
September	904	526	42	--	177	1,296	44
October	887	414	-39	--	194	1,069	46
November	928	568	-145	--	146	1,205	50
December	1,001	650	83	--	300	1,434	47
Average	885	565	(s)	--	195	1,264	--

[1] Stocks are totals as of end of period.
[2] A negative number indicates an increase in stocks and a positive number indicates a decrease.
[3] Beginning in January 1983, product supplied for residual fuel oil does not include crude oil used directly. See Explanatory Note 4.
[4] In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock withdrawal calculations. See Explanatory Note 8.
[5] Beginning in January 1981, survey forms were modified. See Explanatory Note 10.
(s) = Less than 500 barrels per day.
Notes: Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.
Source: See the last page of this section.

Figure S11. Liquefied Petroleum Gases Supply and Disposition

(Thousand Barrels per Day)

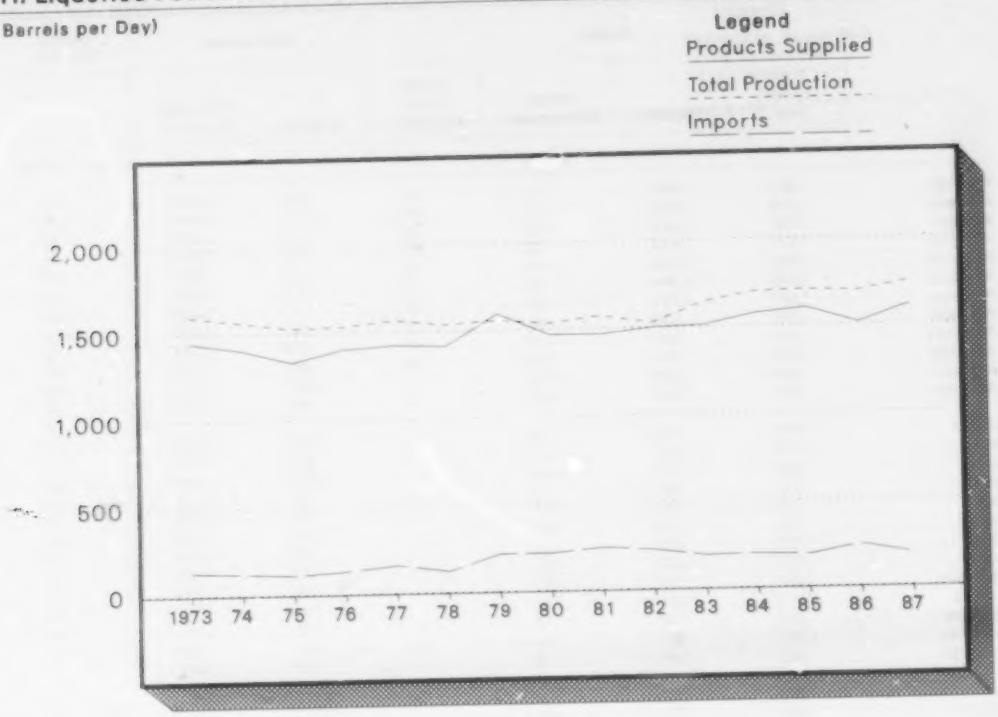


Figure S12. Liquefied Petroleum Gases Ending Stocks

(Million Barrels)

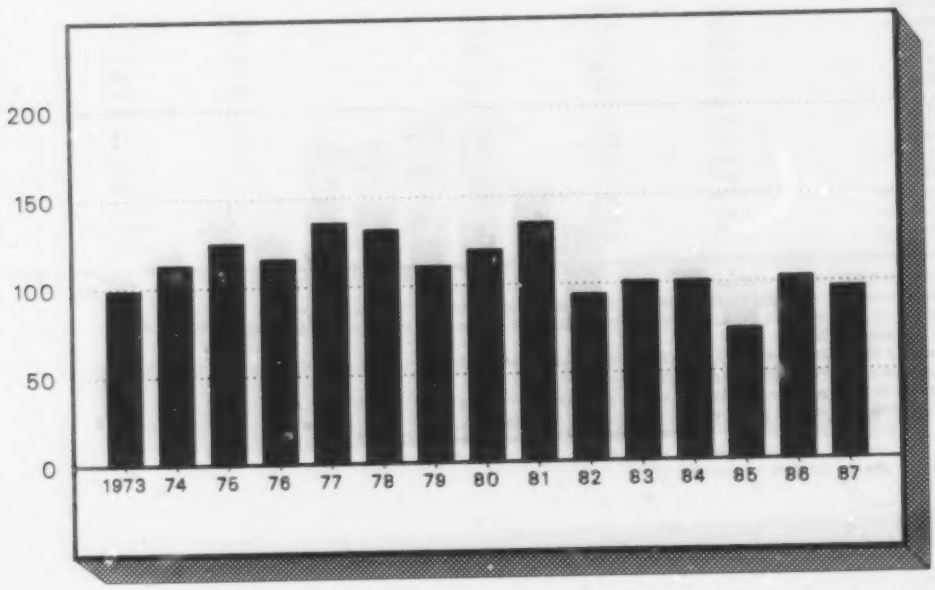


Table S7. Liquefied Petroleum Gases[1] Supply and Disposition

	Supply			Disposition			Ending Stocks[2]
	Total Production	Imports	Stock Withdrawal[3]	Refinery Inputs	Exports	Products Supplied	
	Thousand Barrels per Day						Million Barrels
1973 Average	**1,600**	**132**	**-35**	**220**	**27**	**1,449**	**99**
1974 Average	**1,565**	**123**	**-38**	**220**	**25**	**1,406**	[4] **113**
1975 Average	**1,527**	**112**	[4] **-35**	**246**	**26**	**1,333**	**125**
1976 Average	**1,535**	**130**	**24**	**260**	**25**	**1,404**	**116**
1977 Average	**1,566**	**161**	**-55**	**233**	**18**	**1,422**	**136**
1978 Average	**1,537**	**123**	**12**	**239**	**20**	**1,413**	**132**
1979 Average	**1,556**	**217**	**70**	**236**	**15**	**1,592**	**111**
1980 Average	**1,535**	**216**	**-27**	**233**	**21**	**1,469**	[4] **120**
1981 Average	**1,571**	**244**	[4] **-18**	**289**	**42**	**1,466**	**135**
1982 Average	**1,528**	**226**	**111**	**300**	**65**	**1,499**	[4] **94**
1983 Average	**1,642**	**190**	**4**	**253**	**73**	**1,509**	[4] **101**
1984 Average	**1,697**	**195**	[4] **19**	**291**	**48**	**1,572**	**101**
1985 January	1,676	255	399	322	70	1,937	86
February	1,689	237	330	320	72	1,865	79
March	1,684	223	29	297	52	1,588	78
April	1,696	156	-143	262	78	1,368	83
May	1,713	138	-219	239	40	1,353	89
June	1,728	181	-175	250	51	1,432	95
July	1,713	131	-107	249	68	1,420	98
August	1,710	153	-98	277	80	1,409	101
September	1,667	132	61	321	29	1,510	99
October	1,669	209	304	340	47	1,794	90
November	1,716	188	192	387	88	1,620	84
December	1,786	239	337	386	75	1,901	74
Average	**1,704**	**187**	**75**	**304**	**62**	**1,599**	–
1986 January	1,850	280	80	364	47	1,800	71
February	1,815	206	108	325	74	1,733	68
March	1,693	202	-98	250	47	1,500	71
April	1,642	134	-200	256	33	1,286	77
May	1,685	196	-336	267	40	1,238	87
June	1,649	253	-490	228	25	1,158	102
July	1,684	303	-450	199	50	1,287	116
August	1,619	271	-332	243	53	1,262	126
September	1,631	282	-142	288	27	1,456	131
October	1,625	234	249	332	26	1,750	123
November	1,724	310	254	417	53	1,817	115
December	1,725	227	411	456	33	1,875	103
Average	**1,695**	**242**	**-80**	**302**	**42**	**1,512**	–
1987 January	1,751	153	500	419	43	1,971	87
February	1,762	201	205	341	38	1,789	81
March	1,761	132	-10	282	52	1,550	82
April	1,775	149	-121	274	36	1,493	85
May	1,732	142	-283	269	34	1,288	94
June	1,732	119	-175	255	22	1,400	99
July	1,764	190	-145	244	30	1,534	104
August	1,717	198	-259	252	33	1,372	112
September	1,736	268	-81	266	56	1,622	114
October	1,736	233	59	294	23	1,711	113
November	1,763	233	129	356	35	1,735	109
December	1,753	214	372	395	56	1,887	97
Average	**1,748**	**190**	**15**	**304**	**38**	**1,612**	–

[1] Includes ethane, propane, normal butane, and isobutane. Beginning in January 1984, unfractionated stream is reported by individual product.
[2] Stocks are totals as of end of period.
[3] A negative number indicates an increase in stocks and a positive number indicates a decrease.
[4] In January 1975, 1981, 1983, and 1984, a new stock basis was established affecting stocks reported and stock withdrawal calculations. See Explanatory Note 8.
Notes: Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.
Source: See the last page of this section.

Table S8. Other Petroleum Products[1] Supply and Disposition

	Supply			Disposition			Ending Stocks[2]
	Total Production	Imports	Stock Withdrawal[3]	Refinery Inputs	Exports	Products Supplied	
	Thousand Barrels per Day						Million Barrels
1973 Average	**3,693**	**502**	**-9**	**750**	**166**	**3,270**	**208**
1974 Average	**3,558**	**432**	**-28**	**665**	**174**	**3,123**	**[4] 218**
1975 Average	**3,418**	**277**	**[4] 4**	**537**	**160**	**3,002**	**219**
1976 Average	**3,643**	**206**	**-5**	**524**	**175**	**3,145**	**220**
1977 Average	**3,912**	**205**	**-27**	**514**	**165**	**3,410**	**230**
1978 Average	**4,046**	**166**	**14**	**492**	**167**	**3,568**	**225**
1979 Average	**4,153**	**195**	**-37**	**352**	**209**	**3,749**	**238**
1980 Average	**3,956**	**210**	**-23**	**311**	**198**	**3,634**	**[4] 247**
1981 Average	**3,739**	**226**	**[4] 46**	**723**	**199**	**3,088**	**282**
1982 Average	**3,453**	**334**	**80**	**787**	**211**	**2,869**	**[4] 253**
1983 Average	**3,460**	**411**	**[4] 6**	**712**	**242**	**2,923**	**[4] 256**
1984 Average	**3,632**	**565**	**[4] 23**	**791**	**245**	**3,183**	**240**
1985 January	3,285	400	-88	556	223	2,815	243
February	3,422	498	-101	707	204	2,910	245
March	3,464	550	-421	633	190	2,769	259
April	3,618	628	-7	836	245	3,158	259
May	3,721	837	-113	991	191	3,263	262
June	3,924	612	80	995	261	3,360	260
July	3,994	658	19	975	241	3,455	259
August	4,087	640	372	1,328	218	3,549	248
September	3,878	529	-10	823	274	3,299	248
October	3,810	548	9	861	250	3,255	248
November	3,772	612	-183	906	277	3,016	253
December	3,658	542	226	1,006	305	3,118	246
Average	**3,721**	**588**	**-17**	**886**	**240**	**3,166**	**--**
1986 January	3,902	541	[5] -172	967	311	2,993	252
February	3,868	393	-209	747	270	3,035	[5] 258
March	3,754	454	[5] 21	854	208	3,167	257
April	3,788	638	-100	760	369	3,196	260
May	4,055	659	-114	810	298	3,492	[5] 264
June	4,209	687	[5] -70	853	263	3,710	266
July	4,145	589	[5] 119	1,064	357	3,432	262
August	4,223	572	335	1,061	301	3,768	[5] 252
September	4,225	571	[5] 35	846	278	3,708	[5] 251
October	3,969	575	[5] -112	666	375	3,391	254
November	3,904	559	[5] 36	940	342	3,217	253
December	3,920	490	[5] 90	1,069	325	3,105	250
Average	**3,997**	**561**	**-10**	**888**	**308**	**3,353**	**--**
1987 January	3,852	469	-121	659	219	3,323	254
February	3,796	687	-389	352	320	3,422	265
March	3,766	663	-128	757	281	3,262	269
April	3,933	589	107	872	254	3,502	266
May	4,049	529	178	913	320	3,523	260
June	4,203	712	158	896	320	3,857	255
July	4,363	550	91	835	256	3,913	253
August	4,340	616	-148	693	238	3,876	257
September	4,350	611	-24	903	353	3,681	258
October	4,223	686	14	971	272	3,680	258
November	4,010	583	-20	975	305	3,294	258
December	4,050	633	261	1,091	330	3,523	250
Average	**4,080**	**610**	**1**	**829**	**289**	**3,572**	**--**

[1] Includes pentanes plus, other hydrocarbons and alcohol, unfinished oils, gasoline blending components and all finished petroleum products except finished motor gasoline, distillate fuel oil, residual fuel oil, and liquefied petroleum gases.
[2] Stocks are totals as of end of period.
[3] A negative number indicates an increase in stocks and a positive number indicates a decrease.
[4] In January 1975, 1981, 1983, and 1984, a new stock basis was established affecting stocks reported and stock withdrawal calculations. See Explanatory Note 8.
[5] Ending stocks and stock withdrawal for 1986 are slightly different from those published in the 1986 "Petroleum Supply Annual" (PSA)--Volume 1. PSA statistics inadvertently omitted stocks of other hydrocarbons and alcohol.
Notes: Geographic coverage is the 50 States and the District of Columbia.
Total may not equal sum of components due to independent rounding.
Source: See the last page of this section.

Sources of Summary Statistics

1. 1973 through 1976: U.S. Department of the Interior, Bureau of Mines, *Mineral Industry Surveys*, *Petroleum Statement, Annual* and *PAD Districts Supply/Demand, Annual.*

2. 1977 through 1980: U.S. Department of Energy, Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual* and *PAD Districts Supply/Demand, Annual*, and unleaded gasoline data from *Monthly Petroleum Statistics Report.*

3. 1981 through 1987: EIA, *Petroleum Supply Annual.*

Detailed Statistics

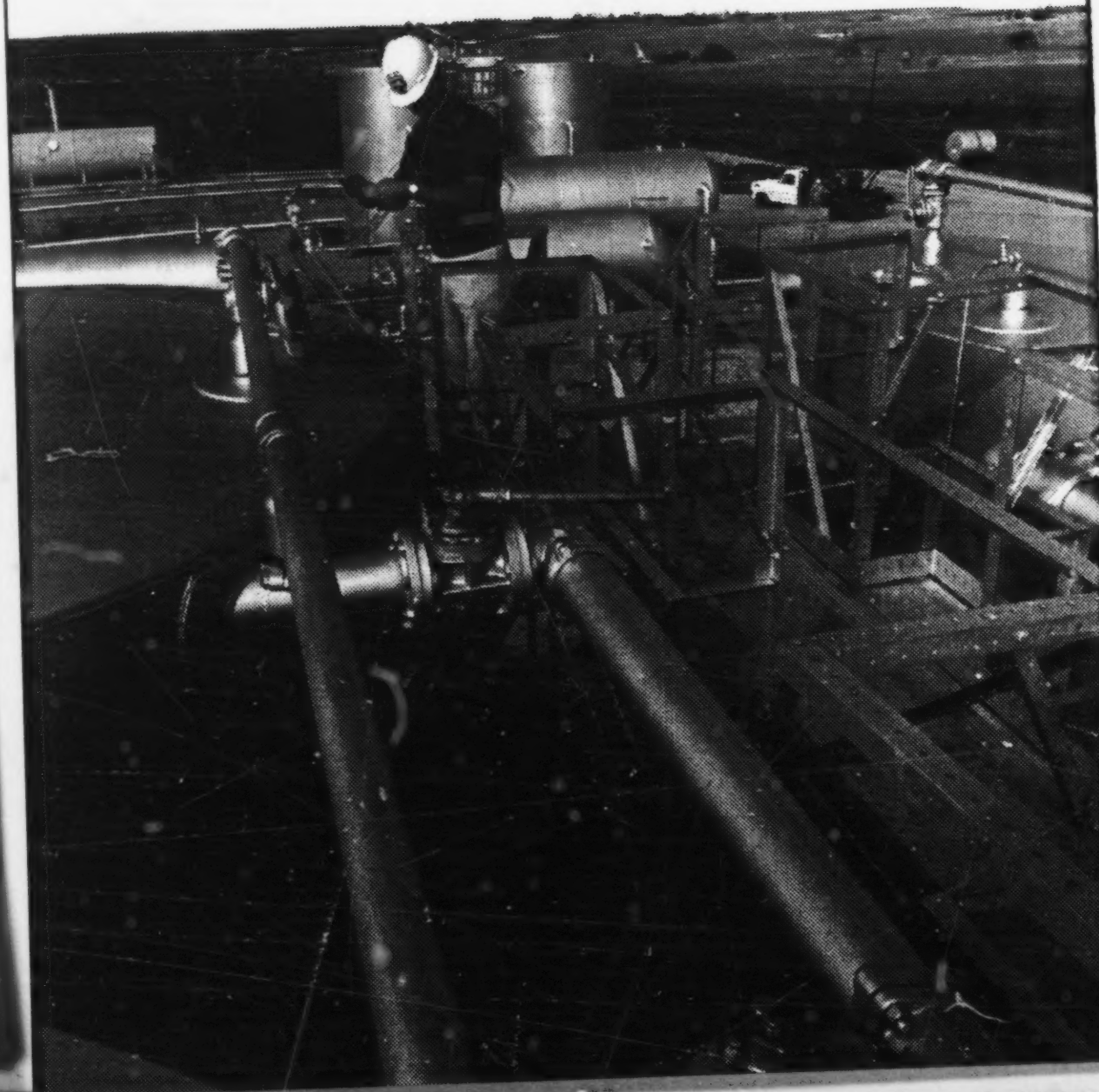


Table 1. U.S. Petroleum Balance, 1987

	Thousand Barrels	Thousand Barrels per Day
Crude Oil (Including Lease Condensate)		
Field Production		
(1) Alaska	715,955	1,962
(2) Lower 48 States	2,331,423	6,387
(3) Total U.S.	3,047,378	8,349
Net Imports		
(4) Imports (Gross Excluding SPR)	1,679,405	4,601
(5) SPR Imports	26,517	73
(6) Exports	54,964	151
(7) Imports (Net Including SPR)	1,650,958	4,523
Other Sources		
(8) SPR Withdrawal (+) or Addition (-)	-29,083	-80
(9) Other Stock Withdrawal (+) or Addition (-)	-17,771	-49
(10) Product Supplied and Losses	-12,580	-34
(11) Unaccounted for [1]	52,882	145
(12) Total Other Sources	-6,552	-18
(13) Crude Input to Refineries	4,691,783	12,854
(13) = (3) + (7) + (12)		
Natural Gas Plant Liquids (NGPL)		
(14) Field Production	582,291	1,595
(15) Net Imports [2]	3,233	9
(16) Stock Withdrawal (+) or Addition (-) [2]	-151	0
(17) Total NGPL Supply	585,373	1,604
Other Liquids		
Unfinished Oils and Gasoline Blending Components, Total		
(18) Stock Withdrawal (+) or Addition (-)	2,244	6
(19) Imports	131,343	360
(20) Other Hydrocarbons and Alcohol New Supply (Field Production)	23,321	64
(21) Refinery Processing Gain [1]	233,265	639
(22) Crude Oil Product Supplied	12,497	34
(23) Total Other Liquids	402,670	1,103
(23) = (18) through (22)		
(24) Total Production of Products [3]	5,679,826	15,561
(24) = (13) + (17) + (23)		
Net Imports of Refined Products [3]		
(25) Imports (Gross)	596,143	1,633
(26) Exports	223,049	611
(27) Imports (Net)	373,094	1,022
(28) Total New Supply of Products	6,052,920	16,583
(28) = (24) + (27)		
(29) Refined Products Stock Withdrawal (+) or Addition (-) [3]	29,822	82
(30) Total Petroleum Products Supplied for Domestic Use	6,082,742	16,665
(30) = (28) + (29)		
(31) Finished Motor Gasoline	2,630,089	7,206
(32) Distillate Fuel Oil	1,086,413	2,976
(33) Residual Fuel Oil	461,504	1,264
(34) Liquefied Petroleum Gases	588,283	1,612
(35) Other [4]	1,303,957	3,572
(36) Crude Oil	12,497	34
(37) Total Product Supplied	6,082,742	16,665
(37) = (31) through (36)		
Ending Stocks, All Oils		
(38) Crude Oil and Lease Condensate (Excluding SPR)	348,995	--
(39) Strategic Petroleum Reserve (SPR)	540,648	--
(40) Unfinished Oils	93,185	--
(41) Gasoline Blending Components [5]	38,055	--
(42) Pentanes Plus	7,025	--
(43) Finished Refined Products [3]	579,543	--
(44) Total Stocks	1,607,451	--

1 A balancing item.
2 Includes products in the pentanes plus category only.
3 For products included see Explanatory Note 7.7.
4 Includes pentanes plus, other liquids, and all finished petroleum products except finished motor gasoline, distillate fuel oil, residual fuel oil and liquefied petroleum gases.
5 Includes other hydrocarbons and alcohol.
Note: Totals may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1, 2 and 7.7.

Table 2. Supply and Disposition of Crude Oil and Petroleum Products, 1987
(Thousand Barrels)

Commodity	Supply					Disposition				
	Field Production	Refinery Production	Imports	Stock Withdrawal (+) or Addition (-)	Unaccounted For Crude Oil[1]	Crude Losses	Refinery Inputs	Exports	Products Supplied	Ending Stocks
Crude Oil (including lease condensate)	**3,047,378**	**0**	**1,705,922**	**-46,854**	**52,881**	**83**	**4,691,783**	**54,964**	**12,497**	**989,643**
Natural Gas Liquids and LRGs	**580,714**	**163,703**	**73,290**	**5,413**	**0**	**0**	**170,009**	**14,522**	**638,489**	**104,119**
Pentanes Plus	106,253	0	3,951	-151	0	0	59,129	718	50,206	7,025
Liquefied Petroleum Gases	474,461	163,703	69,339	5,564	0	0	110,880	13,904	588,283	97,094
Ethane	182,017	3,468	925	-6,840	0	0	619	1,444	177,507	22,261
Propane	183,562	118,580	32,046	15,060	0	0	3,030	8,917	337,300	47,792
Normal Butane	57,480	37,728	21,828	-683	0	0	58,377	2,825	55,151	16,542
Isobutane	51,402	3,927	14,540	-1,973	0	0	48,854	718	18,324	10,499
Other Liquids	**23,321**	**0**	**131,343**	**2,244**	**0**	**0**	**243,600**	**0**	**-86,692**	**131,240**
Other Hydrocarbons and Alcohol	23,321	0	0	-17	0	0	23,304	0	0	427
Unfinished Oils	0	0	109,298	837	0	0	172,376	0	-62,241	93,185
Motor Gasoline Blending Components	0	0	22,045	1,443	0	0	47,948	0	-24,460	37,372
Aviation Gasoline Blending Components	0	0	0	-19	0	0	-28	0	9	256
Finished Petroleum Products	**1,577**	**5,174,954**	**526,804**	**24,259**	**0**	**0**	**0**	**209,145**	**5,518,448**	**482,449**
Finished Motor Gasoline	123	2,497,019	140,204	5,431	0	0	0	12,688	2,630,089	188,811
Finished Leaded Motor Gasoline	111	608,655	13,090	15,114	0	0	0	3,302	633,668	53,117
Finished Unleaded Motor Gasoline	12	1,888,364	127,114	-9,683	0	0	0	9,387	1,996,420	135,694
Finished Aviation Gasoline	0	9,073	103	-135	0	0	0	0	9,041	2,331
Naphtha-Type Jet Fuel	0	74,812	1,172	-884	0	0	0	362	74,538	7,956
Kerosene-Type Jet Fuel	0	415,470	23,325	704	0	0	0	8,517	430,982	41,973
Kerosene	0	28,691	6,334	-68	0	0	0	444	34,513	8,447
Distillate Fuel Oil	516	996,119	93,176	20,612	0	0	0	24,010	1,086,413	134,485
Residual Fuel Oil	0	323,201	206,138	27	0	0	0	67,862	461,504	47,410
Naphtha < 400 Deg. for Petro. Feed. Use	0	41,911	25,954	-169	0	0	0	1,404	66,292	2,337
Other Oils > 400 Deg. for Petro. Feed. Use	0	98,035	2,931	217	0	0	0	5,853	95,330	1,601
Special Naphthas	0	20,936	7,314	105	0	0	0	765	27,590	3,654
Lubricants	0	60,870	5,254	893	0	0	0	8,323	58,694	13,271
Waxes	0	5,879	543	51	0	0	0	562	5,911	783
Petroleum Coke	0	186,902	441	-720	0	0	0	77,579	109,044	6,750
Asphalt and Road Oil	0	158,434	13,271	-1,092	0	0	0	328	170,285	18,799
Still Gas	0	234,529	0	0	0	0	0	0	234,529	0
Miscellaneous Products	938	23,273	644	-714	0	0	0	447	23,694	3,841
Total	**3,653,990**	**5,338,657**	**2,437,359**	**-14,939**	**52,881**	**83**	**5,105,392**	**278,731**	**6,082,742**	**1,607,451**

[1] Unaccounted for crude oil is a balancing item.
(R) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 3. Daily Average Supply and Disposition of Crude Oil and Petroleum Products, 1987
(Thousand Barrels per Day)

Commodity	Supply					Disposition			
	Field Production	Refinery Production	Imports	Stock Withdrawal (+) or Addition (-)	Unaccounted For Crude Oil[1]	Crude Losses	Refinery Inputs	Exports	Products Supplied
Crude Oil (including lease condensate)	8,349	0	4,674	-128	145	(s)	12,854	151	34
Natural Gas Liquids and LRGs	1,591	449	201	15	0	0	466	40	1,749
Pentanes Plus	291	0	11	(s)	0	0	162	2	138
Liquefied Petroleum Gases	1,300	449	190	15	0	0	304	38	1,612
Ethane	499	10	3	-19	0	0	2	4	486
Propane	503	325	88	41	0	0	8	24	924
Normal Butane	157	103	60	-2	0	0	160	8	151
Isobutane	141	11	40	-5	0	0	134	2	50
Other Liquids	64	0	360	6	0	0	667	0	-238
Other Hydrocarbons and Alcohol	64	0	0	(s)	0	0	64	0	0
Unfinished Oils	0	0	299	2	0	0	472	0	-171
Motor Gasoline Blending Components	0	0	60	4	0	0	131	0	-67
Aviation Gasoline Blending Components	0	0	0	(s)	0	0	(s)	0	(s)
Finished Petroleum Products	4	14,178	1,443	56	0	0	0	573	15,119
Finished Motor Gasoline	(s)	6,841	384	15	0	0	0	35	7,206
Finished Leaded Motor Gasoline	(s)	1,668	36	41	0	0	0	9	1,736
Finished Unleaded Motor Gasoline	(s)	5,174	348	-27	0	0	0	26	5,470
Finished Aviation Gasoline	0	25	(s)	(s)	0	0	0	0	25
Naphtha-Type Jet Fuel	0	204	3	-2	0	0	0	1	204
Kerosene-Type Jet Fuel	0	1,138	64	2	0	0	0	23	1,181
Kerosene	0	79	17	(s)	0	0	0	1	95
Distillate Fuel Oil	1	2,729	255	56	0	0	0	66	2,976
Residual Fuel Oil	0	885	565	(s)	0	0	0	186	1,264
Naphtha < 400 Deg. for Petro. Feed. Use	0	115	71	(s)	0	0	0	4	182
Other Oils > 400 Deg. for Petro. Feed. Use	0	269	8	1	0	0	0	16	261
Special Naphthas	0	57	20	(s)	0	0	0	2	76
Lubricants	0	167	14	2	0	0	0	23	161
Waxes	0	16	1	(s)	0	0	0	2	16
Petroleum Coke	0	512	1	-2	0	0	0	213	299
Asphalt and Road Oil	0	434	36	-3	0	0	0	1	467
Still Gas	0	643	0	0	0	0	0	0	643
Miscellaneous Products	3	64	2	-2	0	0	0	1	65
Total	10,008	14,626	6,678	-41	145	(s)	13,987	764	16,665

[1] Unaccounted for crude oil is a balancing item.
(s) = Less than 500 barrels per day.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 4. PAD District I, Supply and Disposition of Crude Oil and Petroleum Products, 1987
(Thousand Barrels)

Commodity	Supply						Disposition				Ending Stocks
	Field Production	Refinery Production	Imports by PADD of Entry	Stock Withdrawal (+) or Addition (-)	Unaccounted For Crude Oil[1]	Net Receipts	Crude Losses	Refinery Inputs	Exports	Products Supplied	
Crude Oil (including lease condensate)	15,134	0	413,193	-27	6,678	21,801	8	456,771	(s)	0	15,535
Natural Gas Liquids and LRGs	9,340	17,539	15,937	-780	0	33,072	0	2,778	315	72,015	5,670
Liquefied Petroleum Gases	8,009	17,539	13,465	-774	0	33,072	0	2,451	315	68,545	5,617
Pentanes Plus	1,331	0	2,472	-6	0	0	0	327	0	3,470	53
Other Liquids	116	0	55,846	1,229	0	4,692	0	71,822	0	-9,939	17,248
Other Hydrocarbons and Alcohol	116	0	0	-20	0	0	0	96	0	0	20
Unfinished Oils	0	0	41,514	1,651	0	1,709	0	57,972	0	-13,098	11,723
Motor Gasoline Blending Components	0	0	14,332	-402	0	2,983	0	13,754	0	3,159	5,505
Aviation Gasoline Blending Components	0	0	0	0	0	0	0	0	0	0	0
Finished Petroleum Products	0	537,645	440,814	27,256	0	871,097	0	0	6,182	1,870,630	159,907
Finished Motor Gasoline	0	251,388	124,109	2,763	0	513,803	0	0	244	891,819	57,469
Finished Leaded Motor Gasoline	0	46,614	10,423	5,405	0	92,838	0	0	19	155,262	12,782
Finished Unleaded Motor Gasoline	0	204,774	113,686	-2,643	0	420,965	0	0	225	736,557	44,687
Finished Aviation Gasoline	0	79	0	-18	0	1,914	0	0	0	1,975	496
Naphtha-Type Jet Fuel	0	7,996	195	-195	0	5,541	0	0	4	13,533	1,561
Kerosene-Type Jet Fuel	0	24,255	17,630	1,304	0	117,108	0	0	175	160,122	10,291
Kerosene	0	2,140	3,537	193	0	6,924	0	0	82	12,712	3,337
Distillate Fuel Oil	0	114,402	84,822	21,590	0	203,104	0	0	441	423,477	53,754
Residual Fuel Oil	0	50,045	192,337	-202	0	6,546	0	0	233	248,493	23,119
Naphtha and Other Oils for Petro. Feed. Use	0	2,445	2,322	20	0	-313	0	0	502	3,972	364
Special Naphthas	0	676	624	-5	0	3,237	0	0	91	4,441	1,286
Lubricants	0	7,838	3,825	622	0	6,354	0	0	2,117	16,512	2,964
Waxes	0	1,004	314	31	0	63	0	0	73	1,339	64
Petroleum Coke	0	14,671	76	196	0	0	0	0	2,022	12,922	520
Asphalt and Road Oil	0	33,632	10,521	718	0	6,044	0	0	9	50,906	3,939
Still Gas	0	23,646	0	0	0	0	0	0	0	23,646	0
Miscellaneous Products	0	3,437	502	239	0	772	0	0	189	4,761	743
Total	24,590	555,184	925,790	27,678	6,678	930,662	8	531,371	6,497	1,932,706	198,360

[1] Unaccounted for crude oil is a balancing item.
(s) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 5. PAD District II, Supply and Disposition of Crude Oil and Petroleum Products, 1987
(Thousand Barrels)

Commodity	Supply						Disposition				Ending Stocks
	Field Production	Refinery Production	Imports by PADD of Entry	Stock Withdrawal (+) or Addition (-)	Unaccounted For Crude Oil[1]	Net Receipts	Crude Losses	Refinery Inputs	Exports	Products Supplied	
Crude Oil (Including lease condensate)	**315,658**	**0**	**170,356**	**10,424**	**-6,757**	**554,226**	**3**	**1,037,962**	**5,955**	**0**	**73,043**
Natural Gas Liquids and LRGs	**111,061**	**29,312**	**28,520**	**-2,040**	**0**	**17,950**	**0**	**49,371**	**5,509**	**129,923**	**32,532**
Liquefied Petroleum Gases	94,552	29,312	28,123	-1,663	0	9,504	0	35,011	4,791	120,026	29,741
Pentanes Plus	16,509	0	397	-377	0	8,446	0	14,360	718	9,897	2,791
Other Liquids	**3,320**	**0**	**258**	**-557**	**0**	**-996**	**0**	**22,605**	**0**	**-20,580**	**21,909**
Other Hydrocarbons and Alcohol	3,320	0	0	-65	0	0	0	3,255	0	0	186
Unfinished Oils	0	0	208	-1,000	0	82	0	4,670	0	-5,380	13,880
Motor Gasoline Blending Components	0	0	50	608	0	-1,078	0	14,789	0	-15,209	7,687
Aviation Gasoline Blending Components	0	0	0	-100	0	0	0	-109	0	9	156
Finished Petroleum Products	**215**	**1,125,480**	**10,213**	**796**	**0**	**251,596**	**0**	**0**	**4,133**	**1,384,167**	**116,742**
Finished Motor Gasoline	0	614,092	1,420	1,273	0	154,703	0	0	512	774,976	93,497
Finished Leaded Motor Gasoline	0	157,877	52	3,526	0	42,565	0	0	24	203,996	17,835
Finished Unleaded Motor Gasoline	0	456,215	1,368	-2,253	0	110,138	0	0	488	570,980	35,662
Finished Aviation Gasoline	0	1,266	0	-186	0	1,252	0	0	0	2,332	695
Naphtha-Type Jet Fuel	0	6,462	943	-411	0	1,096	0	0	66	8,024	1,327
Kerosene-Type Jet Fuel	0	63,611	1,672	200	0	25,816	0	0	75	91,224	8,862
Kerosene	0	5,691	0	-302	0	-991	0	0	211	4,187	2,707
Distillate Fuel Oil	0	233,011	3,394	73	0	62,089	0	0	230	298,337	34,642
Residual Fuel Oil	0	24,285	1,316	415	0	-3,673	0	0	1	22,342	3,038
Naphtha and Other Oils for Petro. Feed. Use	0	17,946	442	-89	0	476	0	0	640	18,135	416
Special Naphthas	0	5,250	603	67	0	1,540	0	0	39	7,421	645
Lubricants	0	8,776	143	330	0	3,157	0	0	504	11,902	2,125
Waxes	0	577	145	5	0	0	0	0	136	591	99
Petroleum Coke	0	39,118	0	1,151	0	0	0	0	1,619	38,650	875
Asphalt and Road Oil	0	53,529	82	-1,499	0	1,926	0	0	81	53,957	7,305
Still Gas	0	48,091	0	0	0	0	0	0	0	48,091	0
Miscellaneous Products	215	3,775	53	-231	0	205	0	0	18	3,999	509
Total	**430,257**	**1,154,792**	**209,347**	**8,623**	**-6,757**	**822,776**	**3**	**1,109,928**	**15,597**	**1,493,510**	**244,226**

[1] Unaccounted for crude oil is a balancing item.
(s) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 6. PAD District III, Supply and Disposition of Crude Oil and Petroleum Products, 1987
(Thousand Barrels)

Commodity	Supply						Disposition				Ending Stocks
	Field Production	Refinery Production	Imports by PADD of Entry	Stock Withdrawal (+) or Addition (-)	Unaccounted For Crude Oil[1]	Net Receipts	Crude Losses	Refinery Inputs	Exports	Products Supplied	
Crude Oil (including lease condensate)	1,396,773	0	1,026,885	-39,949	16,600	-268,927	34	2,131,349	0	0	698,218
Natural Gas Liquids and LRGs	395,804	95,025	19,627	7,340	0	-32,128	0	101,121	7,278	377,269	62,528
Liquefied Petroleum Gases	330,419	95,025	19,374	7,136	0	-25,974	0	60,231	7,278	358,471	58,542
Pentanes Plus	65,385	0	253	204	0	-6,154	0	40,890	0	18,798	3,984
Other Liquids	14,890	0	68,361	4,215	0	-4,338	0	129,325	0	-46,197	57,795
Other Hydrocarbons and Alcohol	14,890	0	0	91	0	0	0	14,981	0	0	193
Unfinished Oils	0	0	65,943	2,560	0	-2,411	0	101,262	0	-35,170	42,610
Motor Gasoline Blending Components	0	0	2,418	1,500	0	-1,927	0	13,009	0	-11,018	14,923
Aviation Gasoline Blending Components	0	0	0	64	0	0	0	73	0	-9	69
Finished Petroleum Products	1,318	2,378,554	53,809	-2,206	0	-1,158,579	0	0	96,535	1,176,361	135,515
Finished Motor Gasoline	123	1,128,212	5,751	1,666	0	-691,185	0	0	7,583	436,9[illegible]	50,966
Finished Leaded Motor Gasoline	111	252,646	148	4,612	0	-140,683	0	0	2,807	114,027	12,776
Finished Unleaded Motor Gasoline	12	875,566	5,603	-2,946	0	-550,502	0	0	4,776	322,957	38,190
Finished Aviation Gasoline	0	5,509	37	37	0	-3,337	0	0	0	2,246	656
Naphtha-Type Jet Fuel	0	37,554	0	-511	0	-9,048	0	0	47	27,948	2,833
Kerosene-Type Jet Fuel	0	203,847	561	502	0	-153,460	0	0	6,868	44,582	14,719
Kerosene	0	18,612	2,797	54	0	-5,933	0	0	127	15,413	2,052
Distillate Fuel Oil	516	462,345	2,855	-974	0	-269,127	0	0	10,277	185,338	31,517
Residual Fuel Oil	0	110,429	9,702	-517	0	-2,879	0	0	19,725	97,016	12,552
Naphtha and Other Oils for Petro. Feed. Use	0	113,917	24,702	93	0	-163	0	0	4,100	134,449	2,835
Special Naphthas	0	13,648	5,965	36	0	-4,811	0	0	510	14,328	1,535
Lubricants	0	37,103	718	-517	0	-9,632	0	0	4,444	23,228	6,510
Waxes	0	3,216	36	-8	0	-63	0	0	233	2,948	429
Petroleum Coke	0	83,536	126	-1,967	0	0	0	0	42,400	39,295	3,417
Asphalt and Road Oil	0	38,942	472	164	0	-7,970	0	0	28	31,580	3,795
Still Gas	0	108,315	0	0	0	0	0	0	0	108,315	0
Miscellaneous Products	679	13,369	87	-274	0	-977	0	0	191	12,693	1,699
Total	1,808,785	2,473,579	1,168,682	-30,600	16,600	-1,463,972	34	2,361,795	103,812	1,507,433	954,054

[1] Unaccounted for crude oil is a balancing item.
(s) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 7. PAD District IV, Supply and Disposition of Crude Oil and Petroleum Products, 1987
(Thousand Barrels)

Commodity	Supply						Disposition				Ending Stocks
	Field Production	Refinery Production	Imports by PADD of Entry	Stock Withdrawal (+) or Addition (-)	Unaccounted For Crude Oil[1]	Net Receipts	Crude Losses	Refinery Inputs	Exports	Products Supplied	
Crude Oil (including lease condensate)	204,916	0	23,563	54	17,194	-86,383	0	159,342	0	1	12,530
Natural Gas Liquids and LRGs	35,935	2,860	5,372	55	0	-18,894	0	6,825	236	18,267	1,088
Liquefied Petroleum Gases	26,501	2,860	4,543	47	0	-16,602	0	5,542	236	11,571	934
Pentanes Plus	9,434	0	829	8	0	-2,292	0	1,283	0	6,696	154
Other Liquids	37	0	0	137	0	0	0	-1,941	0	2,115	4,060
Other Hydrocarbons and Alcohol	37	0	0	-14	0	0	0	23	0	0	14
Unfinished Oils	0	0	0	-296	0	0	0	-2,738	0	2,442	2,322
Motor Gasoline Blending Components	0	0	0	447	0	0	0	767	0	-320	1,724
Aviation Gasoline Blending Components	0	0	0	0	0	0	0	7	0	-7	0
Finished Petroleum Products	44	165,120	1,429	295	0	17	0	0	88	165,817	11,656
Finished Motor Gasoline	0	85,225	612	-189	0	-2,779	0	0	6	82,863	5,055
Finished Leaded Motor Gasoline	0	35,505	180	249	0	-3,786	0	0	1	32,147	2,194
Finished Unleaded Motor Gasoline	0	49,720	432	-438	0	1,007	0	0	5	50,716	2,861
Finished Aviation Gasoline	0	263	0	-7	0	171	0	0	0	427	54
Naphtha-Type Jet Fuel	0	4,816	0	-64	0	-2,098	0	0	1	2,653	430
Kerosene-Type Jet Fuel	0	9,557	0	-60	0	8,165	0	0	1	17,661	836
Kerosene	0	169	0	-58	0	0	0	0	2	109	92
Distillate Fuel Oil	0	40,825	804	188	0	-3,442	0	0	2	38,373	3,098
Residual Fuel Oil	0	3,685	10	-43	0	0	0	0	0	3,652	387
Naphtha and Other Oils for Petro. Feed. Use	0	14	0	-2	0	0	0	0	8	4	33
Special Naphthas	0	-2	0	-1	0	0	0	0	1	-4	7
Lubricants	0	403	0	-39	0	0	0	0	52	312	110
Waxes	0	239	3	18	0	0	0	0	(s)	260	87
Petroleum Coke	0	3,670	0	72	0	0	0	0	1	3,741	31
Asphalt and Road Oil	0	9,255	0	428	0	0	0	0	10	9,673	1,415
Still Gas	0	6,455	0	0	0	0	0	0	0	6,455	0
Miscellaneous Products	44	546	0	52	0	0	0	0	2	640	21
Total	240,931	167,980	30,364	541	17,194	-105,260	0	164,226	323	187,201	29,334

[1] Unaccounted for crude oil is a balancing item.
(s) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 8. PAD District V, Supply and Disposition of Crude Oil and Petroleum Products, 1987
(Thousand Barrels)

Commodity	Supply						Disposition				Ending Stocks
	Field Production	Refinery Production	Imports by PADD of Entry	Stock Withdrawal (+) or Addition (-)	Unaccounted For Crude Oil[1]	Net Receipts	Crude Losses	Refinery Inputs	Exports	Products Supplied	
Crude Oil (including lease condensate)	1,114,896	0	71,925	-17,356	19,168	-220,717	38	906,369	49,009	12,496	90,317
Natural Gas Liquids and LRGs	28,574	18,967	3,834	838	0	0	0	9,914	1,285	41,014	2,303
Liquefied Petroleum Gases	14,980	18,967	3,834	818	0	0	0	7,645	1,285	29,669	2,260
Pentanes Plus	13,594	0	0	20	0	0	0	2,269	0	11,345	43
Other Liquids	4,958	0	6,878	-2,780	0	642	0	21,789	0	-12,091	30,228
Other Hydrocarbons and Alcohol	4,958	0	0	-9	0	0	0	4,949	0	0	14
Unfinished Oils	0	0	1,633	-2,078	0	620	0	11,210	0	-11,035	22,650
Motor Gasoline Blending Components	0	0	5,245	-710	0	22	0	5,629	0	-1,072	7,533
Aviation Gasoline Blending Components	0	0	0	17	0	0	0	1	0	16	31
Finished Petroleum Products	0	968,155	20,539	-1,883	0	35,869	0	0	102,208	920,472	58,629
Finished Motor Gasoline	0	418,102	8,312	-62	0	21,458	0	0	4,342	443,448	21,824
Finished Leaded Motor Gasoline	0	116,013	2,287	1,321	0	9,066	0	0	450	128,237	7,530
Finished Unleaded Motor Gasoline	0	302,089	6,025	-1,403	0	12,392	0	0	3,892	315,211	14,294
Finished Aviation Gasoline	0	1,956	66	39	0	0	0	0	0	2,061	430
Naphtha-Type Jet Fuel	0	17,784	34	297	0	4,509	0	0	245	22,379	1,805
Kerosene-Type Jet Fuel	0	114,200	3,462	-1,242	0	2,371	0	0	1,398	117,394	7,265
Kerosene	0	2,079	0	35	0	0	0	0	23	2,091	259
Distillate Fuel Oil	0	145,536	1,301	-265	0	7,376	0	0	13,060	140,888	11,474
Residual Fuel Oil	0	134,757	2,773	374	0	0	0	0	47,903	90,001	8,314
Naphtha and Other Oils for Petro. Feed. Use	0	5,624	1,419	26	0	0	0	0	2,006	5,063	290
Special Naphthas	0	1,364	122	8	0	34	0	0	124	1,404	181
Lubricants	0	6,760	568	497	0	121	0	0	1,207	6,739	1,562
Waxes	0	843	45	5	0	0	0	0	120	773	104
Petroleum Coke	0	45,906	239	-172	0	0	0	0	31,536	14,437	1,907
Asphalt and Road Oil	0	23,076	2,196	-903	0	0	0	0	199	24,170	2,345
Still Gas	0	48,022	0	0	0	0	0	0	0	48,022	0
Miscellaneous Products	0	2,146	2	-500	0	0	0	0	47	1,601	869
Total	1,148,424	987,122	103,176	-21,181	19,168	-184,206	38	938,072	152,502	961,892	181,477

[1] Unaccounted for crude oil is a balancing item.
(s) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 9. Production of Crude Oil (Including Lease Condensate) by PAD District and State, 1987
(Thousand Barrels)

PAD District and State	Total	Daily Average
PAD District I, Total	**15,134**	**41**
Florida	8,270	23
New York	710	2
Pennsylvania	3,302	9
Virginia	17	(s)
West Virginia	2,835	8
PAD District II, Total	**315,658**	**865**
Illinois	23,980	66
Indiana	3,738	10
Kansas	59,884	164
Kentucky	5,743	16
Michigan	25,972	71
Missouri	110	(s)
Nebraska	6,091	17
North Dakota	41,351	113
Ohio	12,153	33
Oklahoma	134,378	368
South Dakota	1,644	5
Tennessee	614	2
PAD District III, Total	**1,396,773**	**3,827**
Alabama	20,607	56
Arkansas	14,230	39
Louisiana [1]	175,027	480
Mississippi	28,103	77
New Mexico	72,328	198
Texas [1]	760,962	2,085
Federal Offshore PAD District III	325,516	892
PAD District IV, Total	**204,916**	**561**
Colorado	28,802	79
Montana	25,059	69
Utah	35,788	98
Wyoming	115,267	316
PAD District V, Total	**1,114,896**	**3,055**
Alaska [1]	715,955	1,962
South Alaska	16,149	44
North Slope	699,806	1,917
Arizona	131	(s)
California [1]	364,608	999
Nevada	3,112	9
Federal Offshore PAD District V	31,090	85
United States Total [1]	**3,047,378**	**8,349**

[1] Includes the following offshore production (thousand barrels): Alaska: State - 22,726; California: State 30,396; Louisiana State - 25,159; Texas: State - 1,789; U.S. Total, including Federal Offshore - 436,679.
The EIA did not receive final crude oil production data from the following states in time for publication: Alabama, California, Colorado, Illinois, Louisiana, Michigan, Mississippi, Missouri, Montana, Nevada, North Dakota, Oklahoma, Texas, PAD District III Federal Offshore, PAD District V Federal Offshore, and Wyoming.
(s) = Less than 500 barrels or less than 500 barrels per day.
Note: Total may not equal sum of components due to independent rounding.
Source: State Conservation Agencies and the U.S. Minerals Management Service.

Table 10. Natural Gas Processing Plant Net Production of Petroleum Products by PAD District, 1987
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appala-chian #1	Total	Ind., Ill., Ky. *	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Natural Gas Liquids	**2,783**	**6,557**	**9,340**	**13,890**	**5,656**	**91,515**	**111,061**	**222,774**	**34,644**	**85,568**	**6,856**	**45,962**	**395,804**	**35,935**	**28,574**	**580,714**
Pentanes Plus	505	826	1,331	1,884	1,418	13,207	16,509	39,411	3,259	14,850	1,951	5,914	65,385	9,434	13,594	106,253
Liquefied Petroleum Gases	2,278	5,731	8,009	12,006	4,238	78,308	94,552	183,363	31,385	70,718	4,905	40,048	330,419	26,501	14,980	474,461
Ethane	607	1,980	2,587	4,295	24	29,743	34,062	75,174	13,304	31,630	915	18,772	139,795	5,516	57	182,017
Propane	995	2,445	3,440	4,645	2,511	32,103	39,259	68,705	14,956	23,419	2,079	13,774	122,933	13,208	4,722	183,562
Normal Butane	541	931	1,472	1,602	1,616	10,725	13,943	28,317	-13,164	7,525	1,329	4,899	28,906	5,656	7,503	57,480
Isobutane	135	375	510	1,464	87	5,737	7,288	11,167	16,289	8,144	582	2,603	38,785	2,121	2,698	51,402
Finished Petroleum Products	**0**	**0**	**0**	**32**	**0**	**183**	**215**	**472**	**604**	**24**	**198**	**20**	**1,318**	**44**	**0**	**1,577**
Finished Motor Gasoline	0	0	0	0	0	0	0	12	109	0	0	2	123	0	0	123
Finished Leaded Motor Gasoline	0	0	0	0	0	0	0	0	109	0	0	2	111	0	0	111
Finished Unleaded Motor Gasoline	0	0	0	0	0	0	0	12	0	0	0	0	12	0	0	12
Finished Aviation Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Naphtha-Type Jet Fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kerosene-Type Jet Fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kerosene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distillate Fuel Oil	0	0	0	0	0	0	0	0	495	21	0	0	516	0	0	516
Special Naphthas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous Products	0	0	0	32	0	183	215	460	0	3	198	18	679	44	0	938
Total Production	**2,783**	**6,557**	**9,340**	**13,922**	**5,656**	**91,698**	**111,276**	**223,246**	**35,248**	**85,592**	**7,054**	**45,982**	**397,122**	**35,979**	**28,574**	**582,291**

* Effective January 1987 "Appalachian #2" is combined with "Ind., Ill., Ky."
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 11. Refinery Input of Crude Oil and Petroleum Products by PAD District, 1987
(Thousand Barrels, Except Where Noted)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky.*	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Crude Oil (including lease condensate)	**420,938**	**35,833**	**456,771**	**704,242**	**104,763**	**228,947**	**1,037,952**	**171,655**	**1,061,778**	**813,732**	**60,036**	**24,148**	**2,131,349**	**159,342**	**906,369**	**4,691,783**
Pentanes Plus	324	3	327	6,312	1,309	6,739	14,360	12,924	21,069	4,327	932	1,638	40,890	1,283	2,269	59,129
Liquefied Petroleum Gases	1,824	627	2,451	24,306	2,088	8,617	35,011	8,977	20,214	28,908	1,465	667	60,231	5,542	7,645	110,880
Ethane	0	0	0	0	0	0	0	0	30	589	0	0	619	0	0	619
Propane	4	0	4	899	0	0	899	491	1,197	362	0	14	2,064	5	58	3,030
Normal Butane	1,045	627	1,672	11,791	1,283	4,025	17,099	4,213	9,525	15,721	426	273	30,158	4,650	4,798	58,377
Isobutane	775	0	775	11,616	805	4,592	17,013	4,273	9,462	12,236	1,039	380	27,390	887	2,789	48,854
Other Liquids																
Other Hydrocarbons and Alcohol	96	0	96	3,120	34	101	3,255	0	9,157	5,726	0	98	14,981	23	4,949	23,304
Unfinished Oil (net)	55,550	2,422	57,972	2,388	131	2,151	4,670	3,528	80,695	15,910	1,016	113	101,262	-2,738	11,210	172,376
Motor Gasoline Blending Components (net)	13,773	-19	13,754	13,527	9	1,253	14,789	174	6,762	5,703	309	61	13,009	767	5,629	47,948
Aviation Gasoline Blending Components (net)	0	0	0	-115	0	6	-109	0	0	73	0	0	73	7	1	-28
Total Input to Refineries	**492,505**	**38,866**	**531,371**	**753,780**	**108,334**	**247,814**	**1,109,928**	**197,258**	**1,199,675**	**874,379**	**63,758**	**26,725**	**2,361,795**	**164,226**	**938,072**	**5,105,392**
Crude Oil Distillation																
Gross Input (daily average)	1,158	98	1,256	1,937	287	630	2,854	471	2,949	2,273	164	66	5,923	437	2,534	13,003
Operable Capacity (daily average)	1,342	108	1,450	2,235	317	730	3,282	582	3,558	2,699	260	76	7,174	535	3,202	15,642
Operating Ratio (percent)[1]	86.2	91.0	86.6	86.6	90.6	86.3	86.9	80.8	82.9	84.2	63.0	87.6	82.5	81.7	79.1	83.1
Downstream Processing Fresh Feed Input (daily average)																
Catalytic Cracking	497	6	503	688	102	209	999	173	1,121	733	27	22	2,075	145	648	4,370
Catalytic Hydrocracking	47	4	51	107	0	5	112	0	183	202	0	0	385	6	393	946
Cokers	63	0	63	130	42	61	233	7	186	306	9	0	509	16	444	1,265
Crude Oil Qualities																
Sulfur Content, Weighted Average (percent)	1.02	.60	.98	.96	1.95	.54	.97	.61	.87	1.19	1.30	.85	.98	.79	1.07	.99
API Gravity, Weighted Average	31.64	38.44	32.17	35.33	29.98	37.44	35.25	38.42	34.27	31.16	34.10	39.75	33.47	36.21	25.21	32.22
Operable Capacity (daily average)	**1,342**	**108**	**1,450**	**2,235**	**317**	**730**	**3,282**	**582**	**3,558**	**2,699**	**260**	**76**	**7,174**	**535**	**3,202**	**15,642**
Operating	1,276	107	1,383	2,152	312	709	3,173	538	3,451	2,521	233	76	6,819	518	3,022	14,915
Idle	66	1	67	83	5	21	109	44	107	177	27	0	355	17	180	727
Alaskan Crude Oil Receipts	**15,301**	**0**	**15,301**	**13,343**	**0**	**0**	**13,343**	**0**	**59,767**	**81,719**	**0**	**0**	**141,486**	**0**	**448,301**	**618,431**

[1] Represents gross input divided by operable capacity.
(s) = Less than 500 barrels.
* Effective January 1987 "Appalachian #2" is combined with "Ind., Ill., Ky.".
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 12. Refinery Net Production of Petroleum Products by PAD District, 1987
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky. *	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	
Liquefied Refinery Gases	17,218	321	17,539	22,351	2,901	4,060	29,312	2,976	41,248	48,626	1,026	1,149	95,025	2,860	163,703
Ethane	0	0	0	0	0	0	0	-396	3,694	-22	0	0	3,276	0	3,468
Propane	13,696	321	14,017	22,411	2,715	5,082	30,208	3,980	32,126	22,335	795	703	59,939	2,020	118,580
Normal Butane	3,166	0	3,166	-48	48	-1,022	-1,022	-2,792	5,682	26,153	229	446	29,718	975	37,728
Isobutane	356	0	356	-12	138	0	126	2,184	-254	160	2	0	2,092	-135	3,927
Finished Motor Gasoline	237,631	13,757	251,388	418,137	57,579	138,376	614,092	104,329	566,281	424,054	19,004	14,544	1,128,212	85,225	2,497,019
Finished Leaded Motor Gasoline	42,841	3,773	46,614	90,057	15,612	52,208	157,877	34,507	119,086	89,624	3,859	5,570	252,646	35,505	608,655
Finished Unleaded Motor Gasoline	194,790	9,984	204,774	328,080	41,967	86,168	456,215	69,822	447,195	334,430	15,145	8,974	875,566	49,720	1,888,364
Finished Aviation Gasoline	79	0	79	886	227	153	1,266	1,565	2,464	1,480	0	0	5,509	263	9,073
Naphtha-Type Jet Fuel	7,996	0	7,996	3,438	370	2,654	6,462	10,517	11,783	9,968	2,175	3,111	37,554	4,816	74,612
Kerosene-Type Jet Fuel	24,255	0	24,255	45,387	5,427	12,797	63,611	11,254	95,987	94,718	1,416	472	203,847	9,557	415,470
Kerosene	1,263	877	2,140	5,162	519	10	5,691	788	12,785	4,839	200	0	18,612	169	28,691
Distillate Fuel Oil	102,471	11,931	114,402	146,009	26,060	60,942	233,011	41,146	227,488	170,994	17,293	5,424	462,345	40,825	996,119
Residual Fuel Oil	48,579	1,466	50,045	19,968	2,423	1,894	24,285	6,075	61,028	40,480	2,700	146	110,429	3,685	323,201
Naphtha < 400 Deg. for Petro. Feed. Use	2,355	0	2,355	8,744	0	1,059	9,803	1,089	24,701	1,828	194	8	27,820	2	41,911
Other Oils > 400 Deg. for Petro. Feed. Use	90	0	90	7,816	0	327	8,143	1,708	65,441	18,948	0	0	86,097	12	98,035
Special Naphthas	429	247	676	3,926	0	1,324	5,250	1,123	11,205	-700	2,020	0	13,648	-2	20,936
Lubricants	3,437	4,391	7,828	5,179	0	3,597	8,776	263	24,295	7,612	4,933	0	37,103	403	60,870
Waxes	0	1,004	1,004	234	0	343	577	108	1,644	840	624	0	3,216	239	5,879
Petroleum Coke	14,415	257	14,672	25,702	5,657	7,759	39,118	3,972	38,321	39,876	1,160	207	83,536	3,670	186,902
Marketable	3,667	0	3,667	13,760	4,123	4,787	22,670	474	18,779	29,677	753	0	49,683	1,540	111,435
Catalyst	10,748	257	11,005	11,942	1,534	2,972	16,448	3,498	19,542	10,199	407	207	33,853	2,130	75,467
Asphalt and Road Oil	31,119	2,513	33,632	35,546	8,774	9,209	53,529	4,231	8,566	15,344	9,503	1,298	38,942	9,255	158,434
Still Gas	21,676	1,970	23,646	33,233	3,896	10,962	48,091	8,540	59,353	37,419	2,028	975	108,315	6,455	234,529
Miscellaneous Products	2,880	557	3,437	2,755	409	611	3,775	513	7,492	5,236	128	0	13,369	546	23,273
Fuel Use	47	0	47	0	0	6	6	78	0	360	0	0	438	13	605
Non-Fuel Use	2,833	557	3,390	2,755	409	605	3,769	435	7,492	4,876	128	0	12,931	533	22,668
Total Production	**515,893**	**39,291**	**555,184**	**784,473**	**114,242**	**256,077**	**1,154,792**	**200,197**	**1,260,082**	**921,562**	**64,404**	**27,334**	**2,473,579**	**167,980**	**5,338,657**
Processing Gain(-) or Loss(+)[1]	-23,388	-425	-23,813	-30,693	-5,908	-8,263	-44,864	-2,939	-60,407	-47,183	-646	-609	-111,784	-3,754	-233,265

[1] Represents the arithmetic difference between input and output.
* Effective January 1987 "Appalachian #2" is combined with "Ind., Ill., Ky.".
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 13. Percent Refinery Yield of Petroleum Products by PAD District,[1] 1987

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appala-chian #1	Total	Ind., Ill., Ky.*	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Liquefied Refinery Gases	3.6	0.8	3.4	3.2	2.8	1.8	2.8	1.7	3.6	5.9	1.7	4.7	4.3	1.8	2.1	3.4
Finished Motor Gasoline[2]	46.5	34.4	45.6	52.5	51.6	52.6	52.4	47.0	44.6	45.7	26.7	49.8	44.8	49.6	43.3	46.4
Finished Aviation Gasoline[3]	.0	.0	.0	.1	.2	.1	.1	.9	.2	.2	.0	.0	.2	.2	.2	.2
Naphtha-Type Jet Fuel	1.7	0	1.6	.5	.4	1.1	.6	6.0	1.0	1.2	3.6	12.8	1.7	3.1	1.9	1.5
Kerosene-Type Jet Fuel	5.1	.0	4.7	6.4	5.2	5.5	6.1	6.4	8.4	11.4	2.3	1.9	9.1	6.1	12.4	8.5
Kerosene	.3	2.3	.4	.7	.5	.0	.5	.4	1.1	.6	.3	0	.6	.1	.2	.6
Distillate Fuel Oil	21.5	31.2	22.2	20.7	24.8	26.4	22.3	23.5	19.9	20.6	28.3	22.4	20.7	26.1	15.9	20.5
Residual Fuel Oil	10.2	3.8	9.7	2.8	2.3	.8	2.3	3.5	5.3	4.9	4.4	.6	4.9	2.4	14.7	6.6
Naphtha < 400 Deg. for Petro. Feed. Use	.5	0	.5	1.2	0	.5	.9	.6	2.2	.2	.3	.0	1.2	.0	.2	.9
Other Oils > 400 Deg. for Petro. Feed. Use	.0	0	.0	1.1	0	.1	.8	1.0	5.7	2.3	0	0	3.9	.0	.4	2.0
Special Naphthas	.1	.6	.1	.6	0	.6	.5	.6	1.0	-.1	3.3	0	.6	.0	.1	.4
Lubricants	.7	11.5	1.5	.7	0	1.6	.8	.2	2.1	.9	8.1	0	1.7	.3	.7	1.3
Waxes	0	2.6	.2	.0	0	.1	.1	.1	.1	.1	1.0	0	.1	.2	.1	.1
Petroleum Coke	3.0	.7	2.9	3.6	5.4	3.4	3.8	2.3	3.4	4.8	1.9	.9	3.7	2.3	5.0	3.8
Asphalt and Road Oil	6.5	6.6	6.5	5.0	8.4	4.0	5.1	2.4	.7	1.8	15.6	5.4	1.7	5.9	2.5	3.3
Still Gas	4.5	5.1	4.6	4.7	3.7	4.7	4.6	4.9	5.2	4.5	3.3	4.0	4.9	4.1	5.2	4.8
Miscellaneous Products	.6	1.5	.7	.4	.4	.3	.4	.3	.7	.6	.2	0	.6	.3	.2	.5
Processing Gain(-) or Loss(+)[4]	-4.9	-1.1	-4.6	-4.3	-5.6	-3.6	-4.3	-1.7	-5.3	-5.7	-1.1	-2.5	-5.0	-2.4	-5.3	-4.8

1 Based on crude oil input and net reruns of unfinished oils.
2 Based on total finished motor gasoline output plus net output of motor gasoline blending components, minus input of natural gas plant liquids, other hydrocarbons and alcohol.
3 Based on finished aviation gasoline output plus net output of aviation gasoline blending components.
4 Represents the difference between Input and Production.
Note: Total may not equal sum of components due to independent rounding.
* Effective January 1987 "Appalachian #2" is combined with "Ind., Ill., Ky.".
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 14. Imports of Crude Oil and Petroleum Products by PAD District, 1987
(Thousand Barrels)

Commodity	Petroleum Administration for Defense Districts						Total (Daily Average)
	I	II	III	IV	V	Total	
Crude Oil (including lease condensate) [1,2]	**405,596**	**317,384**	**887,454**	**23,563**	**71,925**	**1,705,922**	**4,674**
Natural Gas Liquids	**15,937**	**28,520**	**19,627**	**5,372**	**3,834**	**73,290**	**201**
Pentanes plus	2,472	397	253	829	0	3,951	11
Liquefied Petroleum Gases	13,465	28,123	19,374	4,543	3,834	69,339	190
Ethane	179	232	478	1	34	925	3
Propane	8,039	16,314	5,163	2,096	433	32,046	88
Normal Butane	3,148	6,946	8,246	1,467	2,020	21,828	60
Isobutane	2,099	4,631	5,486	978	1,347	14,540	40
Other Liquids [1]	**55,846**	**257**	**68,361**	**0**	**6,879**	**131,343**	**360**
Unfinished Oils [1]	41,514	207	65,943	0	1,634	109,298	299
Naphthas and Lighter	2,793	112	15,949	0	507	19,361	53
Kerosene and Light Gas Oils	2,267	0	0	0	0	2,267	6
Heavy Gas Oils	28,580	0	14,759	0	1,127	44,466	122
Residuum	7,874	95	35,235	0	0	43,204	118
Motor Gasoline Blending Components	14,332	50	2,418	0	5,245	22,045	60
Aviation Gasoline Blending Components	0	0	0	0	0	0	0
Finished Petroleum Products	**440,814**	**10,213**	**53,809**	**1,429**	**20,539**	**526,804**	**1,443**
Finished Motor Gasoline	124,109	1,420	5,751	612	8,312	140,204	384
Finished Leaded Motor Gasoline	10,423	52	148	180	2,287	13,090	36
Finished Unleaded Motor Gasoline	113,686	1,368	5,603	432	6,025	127,114	348
Finished Aviation Gasoline	0	0	37	0	66	103	(s)
Naphtha-Type Jet Fuel	195	943	0	0	34	1,172	3
Kerosene-Type Jet Fuel	17,630	1,672	561	0	3,462	23,325	64
Bonded Aircraft Fuel	10,457	1,672	306	0	2,350	14,785	41
Other	7,173	0	255	0	1,112	8,540	23
Kerosene	3,537	0	2,797	0	0	6,334	17
Distillate Fuel Oil	84,822	3,394	2,855	804	1,301	93,176	255
Bonded Ships Bunkers	0	0	0	0	0	0	0
Other	84,822	3,394	2,855	804	1,301	93,176	255
Residual Fuel Oil	192,337	1,316	9,702	10	2,773	206,138	565
Bonded Ships Bunkers	0	0	0	0	0	0	0
Other	192,337	1,316	9,702	10	2,773	206,138	565
Naphtha < 400 Deg. for Petro. Feed. Use	2,033	442	22,648	0	831	25,954	71
Other Oils > 400 Deg. for Petro. Feed. Use	289	0	2,054	0	588	2,931	8
Special Naphthas	624	603	5,965	0	122	7,314	20
Lubricants	3,825	143	718	0	568	5,254	14
Waxes	314	145	36	3	45	543	1
Petroleum Coke	76	0	126	0	239	441	1
Asphalt and Road Oil	10,521	82	472	0	2,196	13,271	36
Miscellaneous Products	502	53	87	0	2	644	2
Total Imports	**918,193**	**356,374**	**1,029,251**	**30,364**	**103,177**	**2,437,359**	**6,678**

1 Crude oil and unfinished oils are reported by the PAD District in which they are to be processed; all other products are reported by the PAD District of entry.
2 Includes crude oil imported for storage in the Strategic Petroleum Reserve.
(s) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 15. Imports of Crude Oil and Petroleum Products by Source and PAD District,[1] 1987
(Thousand Barrels)

Source	Crude Oil [2]	LPG	Unfinished Oils	Gasoline Blending Components	Finished Motor Gasoline	Jet Fuel	Kerosene	Distil. Fuel Oil	Resid. Fuel Oil	Special Naphthas	Other Products [3]	Total Products	Total Petroleum	Total (Daily Average)
All PAD Districts														
Arab OPEC														
Algeria	41,932	11,235	6,427	0	0	0	0	6,818	23,156	0	18,049	65,685	107,617	295
Iraq	29,842	0	163	0	0	0	0	216	0	0	0	379	30,221	83
Kuwait	25,630	1,436	3,593	0	0	0	0	0	10	0	0	5,039	30,669	84
Saudi Arabia	234,213	2,669	19,030	0	11,511	3,208	0	254	1,157	35	2,140	40,004	274,217	751
United Arab Emirates	20,602	569	1,029	0	0	0	0	0	0	0	0	1,598	22,200	61
Subtotal Arab OPEC	352,219	15,909	30,242	0	11,511	3,208	0	7,288	24,323	35	20,189	112,705	464,924	1,274
Other OPEC														
Ecuador	8,217	0	385	0	0	0	0	0	2,118	0	0	2,503	10,720	29
Gabon	12,655	0	0	0	0	0	0	0	0	0	0	0	12,655	35
Indonesia	95,775	0	4,196	533	0	1	0	0	3,469	0	0	8,199	103,974	285
Iran	35,942	0	0	0	0	0	0	0	0	0	0	0	35,942	98
Nigeria	193,004	0	1,156	0	0	0	0	0	1,046	0	67	2,269	195,273	535
Venezuela	178,163	3,693	9,790	1,887	25,224	7,598	0	32,814	25,778	0	8,619	115,403	293,566	804
Subtotal Other OPEC	523,756	3,693	15,527	2,420	25,224	7,599	0	32,814	32,411	0	8,686	128,374	652,130	1,787
Other														
Angola	65,657	0	377	0	0	0	0	0	4,140	0	0	4,517	70,174	192
Argentina	712	259	0	0	0	0	0	0	1,875	760	96	2,990	3,702	10
Australia	17,952	1,573	50	0	0	0	0	0	1,296	0	335	3,254	21,206	58
Bahama Islands	0	0	0	0	0	159	0	1,015	12,252	0	15	13,441	13,441	37
Belgium	0	0	4,387	0	5,429	0	0	529	5,085	5	35	15,470	15,470	42
Benin	1,107	0	0	0	0	0	0	0	0	0	0	0	1,107	3
Bermuda	0	0	9	0	0	0	0	0	0	0	0	9	9	(s)
Brazil	0	143	0	417	22,945	0	0	0	6,638	314	214	30,671	30,671	84
Brunei	1,317	0	0	0	0	0	0	0	0	0	0	0	1,317	4
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	193	193	1
Cameroon	15,502	0	0	0	0	0	0	193	0	0	0	2,994	18,496	51
Canada	221,981	40,250	2,718	100	10,264	2,713	336	0	2,994	0	0	2,994	309,551	848
China, People's Republic	22,953	0	0	4,565	1,938	0	0	17,710	7,630	1,345	4,505	87,570	30,018	82
China, Taiwan	0	24	0	0	0	0	0	0	0	0	562	7,065	249	1
Colombia	41,809	0	261	0	0	0	0	0	0	0	225	249	54,101	148
Congo	5,960	0	0	0	0	0	0	485	11,257	17	272	12,292	7,398	20
Denmark	0	(s)	0	0	0	0	0	0	1,438	0	0	1,438	315	1
Egypt	19,884	0	0	0	0	0	0	0	258	0	57	315	19,909	55
Finland	0	0	0	0	162	0	0	0	0	0	25	25	162	(s)
France	0	90	492	0	1,091	0	0	289	356	86	691	3,095	3,095	8
Germany, DR (E)	0	0	0	0	0	0	0	0	0	0	9	9	9	(s)
Germany, FD (W)	0	14	225	0	216	0	0	0	211	82	56	804	804	2
Ghana	0	0	146	0	0	0	0	0	415	0	0	561	561	2
Greece	0	0	333	0	2,076	0	0	195	726	0	0	3,330	3,330	9
Guatemala	1,080	0	0	0	0	0	0	0	0	0	0	0	1,080	3
Hungary	0	0	0	0	0	0	0	0	0	0	0	7	7	(s)
India	0	0	5,568	288	0	0	0	0	0	3,809	270	9,935	9,935	27
Ireland	0	0	236	0	0	0	0	0	0	0	0	236	236	1
Israel	0	0	0	0	794	0	0	472	0	75	0	1,341	1,341	4
Italy	210	44	6,640	0	8,456	272	0	1,360	1,797	0	930	19,499	19,709	54
Ivory Coast	0	0	0	0	0	0	0	0	0	0	140	140	140	(s)
Jamaica	0	0	0	0	0	0	0	0	159	0	0	159	159	(s)
Japan	0	47	0	61	0	0	0	0	0	84	582	774	774	2

See footnotes at end of table.

Table 15. Imports of Crude Oil and Petroleum Products by Source and PAD District,[1] 1987 (continued)
(Thousand Barrels)

Source	Crude Oil [2]	LPG	Unfinished Oils	Gasoline Blending Components	Finished Motor Gasoline	Jet Fuel	Kerosene	Distil. Fuel Oil	Resid. Fuel Oil	Special Naphthas	Other Products [3]	Total Products	Total Petroleum	Total (Daily Average)
							All PAD Districts (continued)							
Other (continued)														
Jordan	0	0	0	0	0	0	0	0	302	0	0	302	302	1
Korea, Republic	0	5	357	245	86	485	0	0	0	3	183	1,365	1,365	4
Liberia	0	0	0	0	0	0	0	259	0	0	0	259	259	1
Malaysia	4,464	0	0	0	0	0	0	0	120	0	0	120	4,584	13
Mauritania	0	0	0	0	0	0	0	0	289	0	0	289	289	1
Mexico	219,552	4,348	1,266	647	0	2,304	0	2,042	4,534	1	4,274	19,416	238,968	655
Netherlands Antilles	0	32	150	0	1,909	637	0	962	6,426	0	371	10,487	10,487	29
Netherlands	0	214	1,470	359	12,590	0	0	2,513	4,051	312	557	22,066	22,066	60
Norway	25,395	882	1,383	0	339	0	0	313	998	0	24	3,939	29,334	80
Oman	12,831	0	449	0	0	0	0	0	0	0	0	449	13,280	36
Pakistan	0	0	0	0	0	0	0	0	0	0	94	94	94	(s)
Panama	0	0	210	0	0	0	0	0	456	0	0	666	666	2
Peru	379	0	602	0	0	0	0	0	9,273	0	0	9,875	10,254	28
Portugal	0	0	0	0	0	0	0	0	0	0	49	49	49	(s)
Puerto Rico	0	0	1,469	0	0	0	0	118	0	0	6,242	7,829	7,829	21
Romania	0	0	1,931	8,272	7,324	0	0	931	997	0	251	19,706	19,706	54
Singapore	561	0	3,078	17	301	795	0	0	5,403	0	353	9,947	10,508	29
South Africa	0	0	0	0	0	0	0	29	0	0	72	101	101	(s)
Spain	0	157	3,552	604	6,953	642	0	0	6,382	0	1,729	20,019	20,019	55
Sweden	0	0	797	0	682	0	0	0	485	0	292	2,256	2,256	6
Switzerland	0	6	0	0	0	0	0	0	0	0	5	11	11	(s)
Syria	568	0	2,092	0	0	0	0	0	1,000	0	0	3,092	3,660	10
Thailand	3,477	0	0	0	0	0	0	0	0	0	0	0	3,477	10
Togo	0	0	72	0	0	0	0	0	140	0	0	212	212	1
Trinidad and Tobago	27,408	0	0	0	522	324	0	1,038	9,580	0	0	11,464	38,872	106
Tunisia	0	0	0	0	961	0	0	0	183	0	0	1,144	1,144	3
Turkey	0	0	958	204	0	0	0	0	0	0	488	1,650	1,650	5
United Kingdom	111,060	1,642	2,039	0	6,335	397	0	1,820	5,086	3	135	17,456	128,516	352
U.S.S.R.	0	0	335	0	258	84	0	1,943	1,032	245	0	3,897	3,897	11
Uruguay	0	7	0	0	0	0	0	0	0	0	0	7	7	(s)
Virgin Islands	0	0	19,877	3,846	11,838	4,878	5,998	18,647	34,140	138	72	99,434	99,434	272
Yugoslavia	0	0	0	0	0	0	0	211	0	0	0	211	211	1
Zaire	8,128	0	0	0	0	0	0	0	0	0	0	0	8,128	22
Subtotal Other	829,947	49,736	63,529	19,625	103,469	13,691	6,334	53,074	149,404	7,279	24,217	490,358	1,320,305	3,617
Total Imports	**1,705,922**	**69,339**	**109,298**	**22,045**	**140,204**	**24,497**	**6,334**	**93,176**	**206,138**	**7,314**	**53,092**	**731,437**	**2,437,359**	**6,678**
							PAD District I							
Arab OPEC														
Algeria	7,311	4,446	5,457	0	0	0	0	6,818	22,088	0	0	38,809	46,120	126
Iraq	811	0	0	0	0	0	0	216	0	0	0	216	1,027	3
Kuwait	555	358	0	0	0	0	0	0	0	0	0	358	913	3
Saudi Arabia	38,518	335	734	0	8,826	2,802	0	254	504	0	0	13,455	51,973	142
United Arab Emirates	2,748	0	0	0	0	0	0	0	0	0	0	0	2,748	8
Subtotal Arab OPEC	49,943	5,139	6,191	0	8,826	2,802	0	7,288	22,592	0	0	52,838	102,781	282

See footnotes at end of table.

Table 15. Imports of Crude Oil and Petroleum Products by Source and PAD District,[1] 1987 (continued)

(Thousand Barrels)

Source	Crude Oil [2]	LPG	Unfinished Oils	Gasoline Blending Components	Finished Motor Gasoline	Jet Fuel	Kerosene	Distil. Fuel Oil	Resid. Fuel Oil	Special Naphthas	Other Products [3]	Total Products	Total Petroleum	Total (Daily Average)
							PAD District I (continued)							
Other OPEC														
Ecuador	3,308	0	385	0	0	0	0	0	2,118	0	0	2,503	5,811	16
Gabon	4,946	0	0	0	0	0	0	0	0	0	0	0	4,946	14
Indonesia	17,453	0	728	0	0	0	0	0	2,672	0	0	3,400	20,853	57
Iran	452	0	0	0	0	0	0	0	0	0	0	0	452	1
Nigeria	73,917	0	0	0	0	0	0	0	684	0	45	729	74,646	205
Venezuela	38,536	1,759	1,904	938	21,722	5,092	0	31,484	25,419	0	7,399	95,717	134,253	368
Subtotal Other OPEC	138,612	1,759	3,017	938	21,722	5,092	0	31,484	30,893	0	7,444	102,349	240,961	660
Other														
Angola	34,185	0	0	0	0	0	0	0	4,140	0	0	4,140	38,325	105
Argentina	0	259	0	0	0	0	0	0	1,875	174	0	2,308	2,308	6
Australia	2,299	96	0	0	0	0	0	0	542	0	322	960	3,259	9
Bahama Islands	0	0	0	0	0	159	0	745	12,252	0	15	13,171	13,171	36
Belgium	0	0	3,153	0	5,429	0	0	529	4,827	0	0	13,938	13,938	38
Benin	390	0	0	0	0	0	0	0	0	0	0	0	390	1
Brazil	0	0	0	0	21,592	0	0	0	6,638	0	173	28,403	28,403	78
Brunei	130	0	0	0	0	0	0	0	0	0	0	0	130	(s)
Bulgaria	0	0	0	0	0	0	0	193	0	0	0	193	193	1
Cameroon	8,041	0	0	0	0	0	0	0	2,994	0	0	2,994	11,035	30
Canada	20,220	4,510	1,044	0	5,353	1,147	336	12,725	5,954	313	1,776	33,158	53,378	146
China, People's Republic	7,562	0	0	0	312	0	0	0	0	0	57	369	7,931	22
China, Taiwan	0	1	0	0	0	0	0	0	0	0	0	1	1	(s)
Colombia	6,325	0	0	0	0	0	0	485	11,257	0	0	11,742	18,067	49
Congo	1,344	0	0	0	0	0	0	0	1,438	0	0	1,438	2,782	8
Denmark	0	(s)	0	0	0	0	0	0	258	0	57	315	315	1
Egypt	14,432	0	0	0	0	0	0	0	0	0	14	14	14,446	40
Finland	0	0	0	0	162	0	0	0	0	0	0	162	162	(s)
France	0	49	0	0	1,091	0	0	288	356	32	276	2,092	2,092	6
Germany, FD (W)	0	13	225	0	216	0	0	0	211	0	56	721	721	2
Ghana	0	0	146	0	0	0	0	0	415	0	0	561	561	2
Greece	0	0	0	0	2,076	0	0	195	719	0	0	2,990	2,990	8
Hungary	0	0	0	0	0	0	0	0	0	0	7	7	7	(s)
India	0	0	207	0	0	0	0	0	0	0	0	207	207	1
Israel	0	0	0	0	794	0	0	239	0	26	0	1,059	1,059	3
Italy	210	(s)	1,462	0	7,921	197	0	1,360	568	0	472	11,981	12,191	33
Ivory Coast	0	0	0	0	0	0	0	0	0	0	140	140	140	(s)
Jamaica	0	0	0	0	0	0	0	0	159	0	0	159	159	(s)
Japan	0	(s)	0	0	0	0	0	0	0	44	147	191	191	1
Korea, Republic	0	5	0	0	0	0	0	0	0	0	0	5	5	(s)
Liberia	0	0	0	0	0	0	0	259	0	0	0	259	259	1
Malaysia	922	0	0	0	0	0	0	0	120	0	0	120	1,042	3
Mauritania	0	0	0	0	0	0	0	0	289	0	0	289	289	1
Mexico	25,693	0	493	162	0	1,646	0	1,591	2,274	0	2,222	8,388	34,081	93
Netherlands Antilles	0	0	150	0	1,647	637	0	962	6,426	0	273	10,095	10,095	28
Netherlands	0	77	738	359	11,821	0	0	2,513	4,051	35	251	19,845	19,845	54
Norway	21,996	760	336	0	339	0	0	0	998	0	0	2,433	24,429	67
Oman	2,018	0	0	0	0	0	0	0	0	0	0	0	2,018	6
Panama	0	0	0	0	0	0	0	0	456	0	0	456	456	1
Peru	379	0	0	0	0	0	0	0	9,273	0	0	9,273	9,652	26

See footnotes at end of table.

Table 15. Imports of Crude Oil and Petroleum Products by Source and PAD District,[1] 1987 (continued)
(Thousand Barrels)

Source	Crude Oil [2]	LPG	Unfinished Oils	Gasoline Blending Components	Finished Motor Gasoline	Jet Fuel	Kerosene	Distil. Fuel Oil	Resid. Fuel Oil	Special Naphthas	Other Products [3]	Total Products	Total Petroleum	Total (Daily Average)
PAD District I (continued)														
Other (continued)														
Portugal	0	0	0	0	0	0	0	0	0	0	18	18	18	(s)
Puerto Rico	0	0	1,469	0	0	0	0	0	0	0	4,455	5,924	5,924	16
Romania	0	0	1,931	8,272	7,324	0	0	931	997	0	251	19,706	19,706	54
Singapore	0	0	1,495	0	0	0	0	0	3,000	0	0	4,495	4,495	12
South Africa	0	0	0	0	0	0	0	0	0	0	35	35	35	(s)
Spain	0	0	2,667	604	6,953	642	0	0	6,382	0	1,495	18,743	18,743	51
Sweden	0	0	262	0	672	0	0	0	485	0	0	1,429	1,429	4
Switzerland	0	6	0	0	0	0	0	0	0	0	5	11	11	(s)
Syria	24	0	0	0	0	0	0	0	646	0	0	646	670	2
Togo	0	0	0	0	0	0	0	0	140	0	0	140	140	(s)
Trinidad and Tobago	4,437	0	0	0	457	324	0	1,038	5,580	0	0	11,399	15,836	43
Tunisia	0	0	0	0	961	0	0	0	183	0	0	1,144	1,144	3
Turkey	0	0	555	204	0	0	0	0	0	0	0	759	759	2
United Kingdom	61,009	790	912	0	6,335	217	0	1,820	4,754	0	34	14,862	75,871	208
U.S.S.R.	0	0	0	0	258	84	0	1,943	567	0	0	2,852	2,852	8
Virgin Islands	0	0	15,061	3,793	11,838	4,878	3,201	18,023	33,628	0	37	90,459	90,459	248
Yugoslavia	0	0	0	0	0	0	0	211	0	0	0	211	211	1
Zaire	5,425	0	0	0	0	0	0	0	0	0	0	0	5,425	15
Subtotal Other	217,041	6,567	32,306	13,394	93,561	9,931	3,537	46,050	138,852	624	12,588	357,410	574,451	1,574
Total Imports	**405,596**	**13,465**	**41,514**	**14,332**	**124,109**	**17,825**	**3,537**	**84,822**	**192,337**	**624**	**20,032**	**512,597**	**918,193**	**2,516**
PAD District II														
Arab OPEC														
Algeria	7,529	0	0	0	0	0	0	0	0	0	0	0	7,529	21
Iraq	11,702	0	0	0	0	0	0	0	0	0	0	0	11,702	32
Kuwait	1,218	0	0	0	0	0	0	0	0	0	0	0	1,218	3
Saudi Arabia	32,855	0	0	0	0	0	0	0	0	0	0	0	32,855	90
Subtotal Arab OPEC	53,304	0	0	0	0	0	0	0	0	0	0	0	53,304	146
Other OPEC														
Indonesia	245	0	0	0	0	0	0	0	0	0	0	0	245	1
Iran	974	0	0	0	0	0	0	0	0	0	0	0	974	3
Nigeria	41,910	0	0	0	0	0	0	0	0	0	0	0	41,910	115
Venezuela	1,935	0	0	0	0	1,243	0	0	0	0	0	1,243	3,178	9
Subtotal Other OPEC	45,064	0	0	0	0	1,243	0	0	0	0	0	1,243	46,307	127
Other														
Angola	1,831	0	0	0	0	0	0	0	0	0	0	0	1,831	5
Cameroon	659	0	0	0	0	0	0	0	0	0	0	0	659	2
Canada	172,432	28,107	207	50	1,420	943	0	3,394	1,316	603	1,229	37,269	209,701	575
Colombia	1,708	0	0	0	0	0	0	0	0	0	0	0	1,708	5
Egypt	2,430	0	0	0	0	0	0	0	0	0	0	0	2,430	7
Germany, FD (W)	0	(s)	0	0	0	0	0	0	0	0	0	(s)	(s)	(s)
Italy	0	2	0	0	0	0	0	0	0	0	0	2	2	(s)
Mexico	21,794	0	0	0	0	430	0	0	0	0	0	430	22,224	61
Norway	915	0	0	0	0	0	0	0	0	0	0	0	915	3

See footnotes at end of table.

Table 15. Imports of Crude Oil and Petroleum Products by Source and PAD District,[1] 1987 (continued)
(Thousand Barrels)

Source	Crude Oil [2]	LPG	Unfinished Oils	Gasoline Blending Components	Finished Motor Gasoline	Jet Fuel	Kerosene	Distil. Fuel Oil	Resid. Fuel Oil	Special Naphthas	Other Products [3]	Total Products	Total Petroleum	Total (Daily Average)
PAD District II (continued)														
Other (continued)														
Oman	377	0	0	0	0	0	0	0	0	0	0	0	377	1
South Africa	0	0	0	0	0	0	0	0	0	0	31	31	31	(s)
Trinidad and Tobago	6,223	0	0	0	0	0	0	0	0	0	0	0	6,223	17
United Kingdom	10,647	7	0	0	0	0	0	0	0	0	2	9	10,656	29
Uruguay	0	7	0	0	0	0	0	0	0	0	0	7	7	(s)
Subtotal Other	219,016	28,123	207	50	1,420	1,373	0	3,394	1,316	603	1,262	37,748	256,764	703
Total Imports	**317,384**	**28,123**	**207**	**50**	**1,420**	**2,615**	**0**	**3,394**	**1,316**	**603**	**1,262**	**38,990**	**356,374**	**976**
PAD District III														
Arab OPEC														
Algeria	27,092	6,789	970	0	0	0	0	0	1,068	0	18,049	26,876	53,968	148
Iraq	17,329	0	163	0	0	0	0	0	0	0	0	163	17,492	48
Kuwait	23,857	1,078	3,593	0	0	0	0	0	10	0	0	4,681	28,538	78
Saudi Arabia	162,840	2,334	18,296	0	135	0	0	0	653	35	2,139	23,592	186,432	511
United Arab Emirates	17,854	490	1,029	0	0	0	0	0	0	0	0	1,519	19,373	53
Subtotal Arab OPEC	248,972	10,691	24,051	0	135	0	0	0	1,731	35	20,188	56,831	305,803	838
Other OPEC														
Ecuador	4,909	0	0	0	0	0	0	0	0	0	0	0	4,909	13
Gabon	7,709	0	0	0	0	0	0	0	0	0	0	0	7,709	21
Indonesia	27,766	0	3,217	533	0	0	0	0	797	0	0	4,547	32,313	89
Iran	34,516	0	0	0	0	0	0	0	0	0	0	0	34,516	95
Nigeria	77,177	0	1,156	0	0	0	0	0	362	0	22	1,540	78,717	216
Venezuela	137,692	1,934	7,886	949	3,502	332	0	1,115	359	0	248	16,325	154,017	422
Subtotal Other OPEC	289,769	1,934	12,259	1,482	3,502	332	0	1,115	1,518	0	270	22,412	312,181	855
Other														
Angola	29,641	0	377	0	0	0	0	0	0	0	0	377	30,018	82
Argentina	712	0	0	0	0	0	0	0	0	586	96	682	1,394	4
Australia	6,363	972	50	0	0	0	0	0	501	0	13	1,536	7,899	22
Belgium	0	0	1,234	0	0	0	0	0	258	0	35	1,527	1,527	4
Benin	717	0	0	0	0	0	0	0	0	0	0	0	717	2
Bermuda	0	0	9	0	0	0	0	0	0	0	0	9	9	(s)
Brazil	0	143	0	17	1,353	0	0	0	0	314	41	1,868	1,868	5
Cameroon	6,802	0	0	0	0	0	0	0	0	0	0	0	6,802	19
Canada	1,122	1	1,464	50	224	0	0	0	240	331	359	2,669	3,791	10
China, People's Republic	15,389	0	0	0	0	0	0	0	0	0	445	445	15,834	43
Colombia	33,776	0	261	0	0	0	0	0	0	17	272	550	34,326	94
Congo	4,616	0	0	0	0	0	0	0	0	0	0	0	4,616	13
Egypt	3,022	0	0	0	0	0	0	0	0	0	11	11	3,033	8
France	0	42	492	0	0	0	0	1	0	54	415	1,004	1,004	3
Germany, DR (E)	0	0	0	0	0	0	0	0	0	0	9	9	9	(s)
Germany, FD (W)	0	0	0	0	0	0	0	0	0	77	0	77	77	(s)
Greece	0	0	333	0	0	0	0	0	0	0	0	333	333	1
Guatemala	1,080	0	0	0	0	0	0	0	0	0	0	0	1,080	3
India	0	0	5,108	288	0	0	0	0	0	3,809	270	9,475	9,475	26

See footnotes at end of table.

Table 15. Imports of Crude Oil and Petroleum Products by Source and PAD District,[1] 1987 (continued)
(Thousand Barrels)

Source	Crude Oil [2]	LPG	Unfinished Oils	Gasoline Blending Components	Finished Motor Gasoline	Jet Fuel	Kerosene	Distil. Fuel Oil	Resid. Fuel Oil	Special Naphthas	Other Products [3]	Total Products	Total Petroleum	Total (Daily Average)
PAD District III (continued)														
Other (continued)														
Ireland	0	0	236	0	0	0	0	0	0	0	0	236	236	1
Israel	0	0	0	0	0	0	0	233	0	42	0	275	275	1
Italy	0	41	4,770	0	262	0	0	0	1,229	0	458	6,780	6,780	19
Japan	0	37	0	43	0	0	0	0	0	40	147	267	267	1
Jordan	0	0	0	0	0	0	0	0	302	0	0	302	302	1
Korea, Republic	0	0	357	0	0	0	0	0	0	0	0	357	357	1
Mexico	172,065	4,348	773	485	0	229	0	451	2,260	1	428	8,975	181,040	496
Netherlands Antilles	0	32	0	0	0	0	0	0	0	0	98	130	130	(s)
Netherlands	0	126	732	0	107	0	0	0	0	273	306	1,544	1,544	4
Norway	2,484	122	1,047	0	0	0	0	313	0	0	24	1,506	3,990	11
Oman	10,436	0	449	0	0	0	0	0	0	0	0	449	10,885	30
Pakistan	0	0	0	0	0	0	0	0	0	0	94	94	94	(s)
Panama	0	0	210	0	0	0	0	0	0	0	0	210	210	1
Peru	0	0	602	0	0	0	0	0	0	0	0	602	602	2
Portugal	0	0	0	0	0	0	0	0	0	0	31	31	31	(s)
Puerto Rico	0	0	0	0	0	0	0	118	0	0	1,504	1,622	1,622	4
Singapore	262	0	1,346	0	148	0	0	0	0	0	0	1,494	1,756	5
South Africa	0	0	0	0	0	0	0	0	0	0	4	4	4	(s)
Spain	0	157	685	0	0	0	0	0	0	0	234	1,056	1,056	3
Sweden	0	0	535	0	0	0	0	0	0	0	292	827	827	2
Syria	544	0	2,092	0	0	0	0	0	354	0	0	2,446	2,990	8
Thailand	827	0	0	0	0	0	0	0	0	0	0	0	827	2
Togo	0	0	72	0	0	0	0	0	0	0	0	72	72	(s)
Trinidad and Tobago	16,748	0	0	0	0	0	0	0	0	0	0	0	16,748	46
Turkey	0	0	403	0	0	0	0	0	0	0	253	656	656	2
United Kingdom	39,404	727	1,127	0	0	0	0	0	332	3	99	2,288	41,692	114
U.S.S.R.	0	0	335	0	0	0	0	0	465	245	0	1,045	1,045	3
Virgin Islands	0	0	4,554	53	0	0	2,797	624	512	136	35	8,713	8,713	24
Zaire	2,703	0	0	0	0	0	0	0	0	0	0	0	2,703	7
Subtotal Other	348,713	6,749	29,633	936	2,114	229	2,797	1,740	6,453	5,930	5,973	62,554	411,267	1,127
Total Imports	**887,454**	**19,374**	**65,943**	**2,418**	**5,751**	**561**	**2,797**	**2,855**	**9,702**	**5,965**	**26,431**	**141,797**	**1,029,251**	**2,820**
PAD District IV														
Other														
Canada	23,563	4,543	0	0	612	0	0	804	10	0	832	6,801	30,364	83
United Kingdom	0	(s)	0	0	0	0	0	0	0	0	0	(s)	(s)	(s)
Subtotal Other	23,563	4,543	0	0	612	0	0	804	10	0	832	6,801	30,364	83
Total Imports	**23,563**	**4,543**	**0**	**0**	**612**	**0**	**0**	**804**	**10**	**0**	**832**	**6,801**	**30,364**	**83**

See footnotes at end of table.

Table 15. Imports of Crude Oil and Petroleum Products by Source and PAD District,[1] 1987 (continued)

(Thousand Barrels)

Source	Crude Oil [2]	LPG	Unfinished Oils	Gasoline Blending Components	Finished Motor Gasoline	Jet Fuel	Kerosene	Distil. Fuel Oil	Resid. Fuel Oil	Special Naphthas	Other Products [3]	Total Products	Total Petroleum	Total (Daily Average)
							PAD District V							
Arab OPEC														
Saudi Arabia	0	0	0	0	2,550	406	0	0	0	0	1	2,957	2,957	8
United Arab Emirates	0	79	0	0	0	0	0	0	0	0	0	79	79	(s)
Subtotal Arab OPEC	0	79	0	0	2,550	406	0	0	0	0	1	3,036	3,036	8
Other OPEC														
Indonesia	50,311	0	251	0	0	1	0	0	0	0	0	252	50,563	139
Venezuela	0	0	0	0	0	931	0	215	0	0	972	2,118	2,118	6
Subtotal Other OPEC	50,311	0	251	0	0	932	0	215	0	0	972	2,370	52,681	144
Other														
Australia	9,290	505	0	0	0	0	0	0	253	0	0	758	10,048	28
Bahama Islands	0	0	0	0	0	0	0	270	0	0	0	270	270	1
Belgium	0	0	0	0	0	0	0	0	0	5	0	5	5	(s)
Brazil	0	0	0	400	0	0	0	0	0	0	0	400	400	1
Brunei	1,187	0	0	0	0	0	0	0	0	0	0	0	1,187	3
Canada	4,644	3,088	3	0	2,655	623	0	787	110	98	309	7,673	12,317	34
China, People's Republic	2	0	0	4,565	1,626	0	0	0	0	0	60	6,251	6,253	17
China, Taiwan	0	24	0	0	0	0	0	0	0	0	225	249	249	1
Germany, FD (W)	0	(s)	0	0	0	0	0	0	0	5	0	5	5	(s)
Greece	0	0	0	0	0	0	0	0	7	0	0	7	7	(s)
India	0	0	253	0	0	0	0	0	0	0	0	253	253	1
Israel	0	0	0	0	0	0	0	0	0	7	0	7	7	(s)
Italy	0	0	408	0	253	75	0	0	0	0	0	736	736	2
Japan	0	9	0	18	0	0	0	0	0	0	288	315	315	1
Korea, Republic	0	1	0	245	86	485	0	0	0	3	183	1,003	1,003	3
Malaysia	3,542	0	0	0	0	0	0	0	0	0	0	0	3,542	10
Mexico	0	0	0	0	0	0	0	0	0	0	1,624	1,624	1,624	4
Netherlands Antilles	0	0	0	0	262	0	0	0	0	0	0	262	262	1
Netherlands	0	10	0	0	662	0	0	0	0	4	0	676	676	2
Puerto Rico	0	0	0	0	0	0	0	0	0	0	283	283	283	1
Singapore	299	0	237	17	153	795	0	0	2,403	0	353	3,958	4,257	12
South Africa	0	0	0	0	0	0	0	29	0	0	2	31	31	(s)
Spain	0	0	220	0	0	0	0	0	0	0	0	220	220	1
Thailand	2,650	0	0	0	0	0	0	0	0	0	0	0	2,650	7
Trinidad and Tobago	0	0	0	0	65	0	0	0	0	0	0	65	65	(s)
Turkey	0	0	0	0	0	0	0	0	0	0	235	235	235	1
United Kingdom	0	118	0	0	0	180	0	0	0	0	0	298	298	1
Virgin Islands	0	0	262	0	0	0	0	0	0	0	0	262	262	1
Subtotal Other	21,614	3,755	1,383	5,245	5,762	2,159	0	1,086	2,773	122	3,562	25,846	47,460	130
Total Imports	**71,925**	**3,834**	**1,634**	**5,245**	**8,312**	**3,496**	**0**	**1,301**	**2,773**	**122**	**4,535**	**31,252**	**103,177**	**283**

1 Crude Oil and unfinished oils are reported by the PAD District in which they are to be processed; all other products are reported by the PAD District of entry.

2 Includes crude oil imported for storage in the Strategic Petroleum Reserve.

3 Includes aviation gasoline, aviation gasoline blending components, waxes, asphalt, lubricants, pentanes plus, naphthas less than 400 degrees F, other oils greater than 400 degrees F, petroleum coke and miscellaneous products.

(s) = Less than 500 barrels.

Note: Total may not equal sum of components due to independent rounding.

Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 16. Exports of Crude Oil and Petroleum Products by PAD District, 1987
(Thousand Barrels)

Commodity	Petroleum Administration for Defense Districts						Daily Average
	I	II	III	IV	V	Total	
Crude Oil (including lease condensate) [1]	(s)	5,955	0	0	49,009	54,964	151
Natural Gas Liquids	315	5,509	7,278	236	1,285	14,622	40
Pentanes Plus	0	718	0	0	0	718	2
Liquefied Petroleum Gases	315	4,791	7,278	236	1,285	13,904	38
Ethane	3	1,436	2	0	2	1,444	4
Propane	190	1,343	6,771	95	518	8,917	24
Normal Butane	122	1,293	504	140	765	2,825	8
Isobutane	0	718	0	0	0	718	2
Finished Motor Gasoline	244	512	7,583	6	4,342	12,688	35
Naphtha-Type Jet Fuel	4	66	47	1	245	362	1
Kerosene-Type Jet Fuel	175	75	6,868	1	1,398	8,517	23
Kerosene	82	211	127	2	23	444	1
Distillate Fuel Oil	441	230	10,277	2	13,060	24,010	66
Residual Fuel Oil	233	1	19,725	0	47,903	67,862	186
Naphtha < 400 Deg. for Petro. Feed. Use	416	191	333	8	456	1,404	4
Other Oils > 400 Deg. for Petro. Feed. Use	86	449	3,767	0	1,551	5,853	16
Special Naphthas	91	39	510	1	124	765	2
Lubricants	2,117	504	4,444	52	1,207	8,323	23
Waxes	73	136	233	(s)	120	562	2
Petroleum Coke	2,022	1,619	42,400	1	31,536	77,579	213
Asphalt	9	81	28	10	199	328	1
Miscellaneous Products	189	18	191	2	47	447	1
Total Product Exports	6,497	9,642	103,812	323	103,493	223,767	613
Total Exports	**6,497**	**15,597**	**103,812**	**323**	**152,502**	**278,731**	**764**

[1] Crude oil exports are restricted to: 1) crude oil derived from fields under the State waters of Alaska's Cook Inlet; 2) certain domestically produced crude oil destined for Canada; and 3) shipments to U.S. territories.

(s) = Less than 500 barrels.

Note: Total may not equal sum of components due to independent rounding.

Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 17. Exports of Crude Oil and Petroleum Products by Destination, 1987
(Thousand Barrels)

Destination	Crude Oil [1]	LPG	Finished Motor Gasoline	Jet Fuel	Dist. Fuel Oil	Residual Fuel Oil	Special Naphthas	Lubricants	Waxes	Petroleum Coke	Asphalt	Other[2]	Total	Total (Daily Average)
Argentina	0	20	0	0	479	1,004	2	13	2	54	0	117	1,692	5
Australia	202	11	540	83	791	1,666	32	206	3	2,165	1	49	5,749	16
Bahamas	0	96	627	559	2,332	6,449	0	62	0	0	1	2	10,127	28
Bahrain	0	2	0	0	0	0	(s)	1	0	366	0	1	370	1
Belgium & Luxembourg	0	452	(s)	0	0	0	22	171	3	5,687	(s)	17	6,353	17
Brazil	0	3	65	0	100	0	18	70	(s)	300	(s)	12	568	2
Cameroon	0	0	0	0	0	0	0	(s)	(s)	177	(s)	(s)	178	(s)
Canada	5,988	5,106	1,078	3,817	2,489	3,578	349	1,422	176	4,102	278	1,853	30,235	83
Chile	0	3	0	0	132	6	3	167	1	(s)	(s)	10	321	1
China, Taiwan	360	23	147	0	1,081	3,605	1	358	20	417	(s)	135	6,147	17
Colombia	0	1	0	0	0	0	3	93	1	(s)	0	17	116	(s)
Costa Rica	0	2	11	0	0	0	17	89	1	(s)	20	65	204	1
Denmark	0	4	0	0	0	0	0	1	(s)	1,181	1	5	1,192	3
Dominican Republic	0	218	75	0	61	(s)	7	59	(s)	1	0	6	427	1
Ecuador	0	93	0	0	218	0	3	158	2	0	(s)	9	483	1
Egypt	0	7	0	0	0	0	0	46	(s)	132	(s)	12	197	1
El Salvador	0	14	96	6	25	(s)	2	59	(s)	1	(s)	2	205	1
Finland	0	0	0	0	0	0	0	25	(s)	0	(s)	1	26	(s)
France	0	5	(s)	0	350	0	1	184	28	2,842	(s)	1,142	4,554	12
French Pacific Isl	0	(s)	0	0	0	723	0	2	0	0	0	(s)	726	2
Ghana	0	0	0	0	0	0	0	1	0	315	(s)	(s)	317	1
Greece	0	3	0	0	0	0	1	35	(s)	748	0	1	787	2
Guatemala	0	305	813	158	999	0	14	106	4	(s)	(s)	4	2,403	7
Guinea	0	(s)	0	0	0	0	0	17	0	0	(s)	(s)	17	(s)
Honduras	0	28	10	0	138	0	5	70	1	0	0	7	258	1
Hong Kong	0	1	0	0	(s)	0	1	17	2	0	(s)	7	29	(s)
India	0	10	0	0	0	0	2	77	2	0	0	52	143	(s)
Indonesia	0	(s)	0	0	0	0	0	38	(s)	214	(s)	10	262	1
Iran	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Israel	0	1	21	0	0	0	1	5	(s)	1	(s)	11	39	(s)
Italy	0	154	0	0	583	1,863	17	35	6	11,492	1	1,158	15,308	42
Ivory Coast	0	0	0	0	0	0	0	59	(s)	0	(s)	0	59	(s)
Jamaica	0	241	81	10	321	3,206	1	81	3	0	0	12	3,957	11
Japan	0	84	5,608	2,625	6,557	8,364	163	372	25	19,318	1	683	43,799	120
Jordan	0	1	0	0	0	0	0	10	0	0	0	1	11	(s)
Korea, Republic	543	90	39	0	1,953	5,089	20	81	32	763	(s)	519	9,130	25
Kuwait	0	3	0	0	0	0	(s)	10	0	0	(s)	2	16	(s)
Lebanon	0	0	0	0	0	0	0	2	(s)	0	0	1	2	(s)
Liberia	0	(s)	0	0	0	0	0	2	0	0	(s)	(s)	2	(s)
Malaysia	0	(s)	0	0	0	209	0	5	8	17	(s)	141	379	1
Mexico	0	5,681	1,446	487	115	15,510	20	1,174	164	830	3	115	25,544	70
Netherlands	0	145	17	281	930	206	13	76	5	11,978	2	661	14,312	39
Netherlands Antilles	0	(s)	9	3	407	5,917	(s)	236	(s)	0	0	26	6,599	18
New Zealand	0	(s)	540	0	0	0	5	31	3	483	(s)	10	1,072	3
Nigeria	0	2	0	0	0	0	0	5	0	0	(s)	2	8	(s)
Norway	0	9	0	0	0	0	0	3	(s)	678	(s)	2	692	2
Pacific Trust Terr.	0	2	0	0	0	0	0	1	0	0	(s)	(s)	3	(s)
Panama	0	99	231	0	383	898	5	314	(s)	(s)	(s)	7	1,937	5
Peru	0	153	30	566	873	0	(s)	179	1	(s)	(s)	9	1,811	5
Philippines	0	27	0	0	0	0	2	16	4	(s)	0	212	260	1
Puerto Rico	6,190	57	905	0	43	463	5	215	14	1	(s)	85	7,979	22
Rep. of South Africa	0	225	0	0	0	0	0	5	(s)	342	1	3	576	2
Saudi Arabia	0	66	0	0	0	0	1	44	0	2	1	24	139	(s)

See footnotes at end of table.

Table 17. Exports of Crude Oil and Petroleum Products by Destination, 1987 (continued)
(Thousand Barrels)

Destination	Crude Oil [1]	LPG	Finished Motor Gasoline	Jet Fuel	Dist Fuel Oil	Residual Fuel Oil	Special Naphthas	Lubricants	Waxes	Petroleum Coke	Asphalt	Other[2]	Total	Total (Daily Average)
Singapore	0	4	0	0	576	3,591	5	66	1	25	(s)	332	4,600	13
Spain	0	1	0	9	1,315	3,464	(s)	20	(s)	6,017	(s)	675	11,493	31
Surinam	0	108	0	0	0	672	0	6	0	11	0	2	799	2
Sweden	0	1	0	59	0	0	0	13	2	407	1	65	547	1
Switzerland	0	5	0	0	0	0	(s)	8	(s)	2	(s)	1	16	(s)
Thailand	0	2	0	0	0	0	1	22	6	(s)	(s)	256	286	1
Trinidad and Tobago	0	1	0	0	1	0	1	3	(s)	0	0	3	10	(s)
Turkey	0	0	0	0	0	0	(s)	26	(s)	1,905	0	6	1,937	5
United Arab Emirates	0	4	0	0	1	0	(s)	105	(s)	480	0	2	593	2
United Kingdom	7	71	44	(s)	247	566	1	136	4	1,242	11	37	2,366	6
U.S.S.R.	0	0	0	0	0	0	0	923	0	629	0	79	1,631	4
Uruguay	0	0	0	0	0	0	(s)	11	(s)	0	0	1	12	(s)
Venezuela	0	5	0	2	1	1	17	28	3	1,053	0	14	1,124	3
Virgin Islands	41,674	(s)	18	0	1	0	(s)	16	0	0	0	14	41,724	114
West Germany	0	88	1	0	0	0	3	288	32	674	3	63	1,152	3
Yugoslavia	0	0	0	0	0	0	0	(s)	(s)	381	0	0	381	1
Other	0	166	238	224	509	811	(s)	145	1	145	1	98	2,337	6
Total	**54,964**	**13,904**	**12,688**	**8,679**	**24,010**	**67,862**	**765**	**8,323**	**562**	**77,579**	**328**	**8,867**	**278,731**	**764**

[1] Crude oil exports are restricted to: 1) crude oil derived from fields under the State waters of Alaska's Cook Inlet; 2) certain domestically produced crude oil destined for Canada; and 3) shipments to U.S. territories.
[2] Includes pentanes plus, kerosene, naphtha less than 400 degrees F, other oils greater than 400 degrees F and miscellaneous products.
(s) = Less than 500 barrels.
Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 18. Stocks of Crude Oil and Petroleum Products by PAD District, December 31, 1987
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky.	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Crude Oil (incl. lease condensate)																
Refinery	--	--	14,298	--	--	--	12,662	--	--	--	--	--	44,773	1,960	22,158	95,851
Tank Farms and Pipelines	--	--	1,197	--	--	--	58,948	--	--	--	--	--	95,750	9,395	39,323	204,613
Leases	--	--	40	--	--	--	1,433	--	--	--	--	--	17,047	1,175	1,482	21,177
Strategic Petroleum Reserve[1]	--	--	0	--	--	--	0	--	--	--	--	--	540,648	0	0	540,648
Alaskan In-Transit	--	--	0	--	--	--	0	--	--	--	--	--	0	0	27,354	27,354
Total	--	--	15,535	--	--	--	73,043	--	--	--	--	--	698,218	12,530	90,317	889,643
Total Stocks, All Oils (excl. Crude Oil)																
Refinery	43,206	3,147	46,353	36,113	6,378	16,086	58,577	10,747	70,977	47,712	5,756	1,121	136,313	10,904	61,216	313,363
Bulk Terminal	--	--	108,953	--	--	--	74,845	--	--	--	--	--	69,078	3,098	24,792	280,766
Pipeline	--	--	27,348	--	--	--	35,503	--	--	--	--	--	44,279	2,624	5,032	114,786
Natural Gas Processing Plant	128	43	171	602	40	1,616	2,258	1,070	2,561	2,318	96	121	6,166	178	120	8,893
Total	--	--	182,825	--	--	--	171,183	--	--	--	--	--	255,836	16,804	91,160	717,808
Pentanes Plus																
Refinery	19	0	19	72	56	107	235	296	210	111	2	22	641	1	17	913
Bulk Terminal	--	--	20	--	--	--	1,479	--	--	--	--	--	1,196	0	9	2,704
Pipeline	--	--	0	--	--	--	725	--	--	--	--	--	699	82	0	1,506
Natural Gas Processing Plant	6	8	14	25	14	313	352	321	301	764	32	30	1,448	71	17	1,902
Total	--	--	53	--	--	--	2,791	--	--	--	--	--	3,984	154	43	7,025
Liquefied Petroleum Gases																
Refinery	954	10	964	2,080	118	624	2,822	1,478	2,299	2,565	26	18	6,386	323	519	11,014
Bulk Terminal	--	--	2,351	--	--	--	17,807	--	--	--	--	--	41,427	73	1,638	63,296
Pipeline	--	--	2,145	--	--	--	7,206	--	--	--	--	--	6,046	431	0	15,828
Natural Gas Processing Plant	122	35	157	577	26	1,303	1,906	724	2,256	1,550	62	91	4,683	107	103	6,956
Total	--	--	5,617	--	--	--	29,741	--	--	--	--	--	58,542	934	2,260	97,094
Ethane																
Refinery	0	0	0	1	0	0	1	36	250	0	0	0	286	0	0	287
Bulk Terminal	--	--	2	--	--	--	3,280	--	--	--	--	--	13,804	0	0	17,086
Pipeline	--	--	0	--	--	--	1,476	--	--	--	--	--	2,294	126	0	3,896
Natural Gas Processing Plant	0	0	0	15	0	125	140	81	654	109	1	5	850	2	0	992
Total	--	--	2	--	--	--	4,897	--	--	--	--	--	17,234	128	0	22,261

See footnotes at end of table.

Table 18. Stocks of Crude Oil and Petroleum Products by PAD District, December 31, 1987 (continued)
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky.	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Propane																
Refinery	693	2	695	1,338	26	159	1,523	715	797	1,137	5	2	2,656	77	156	5,107
Bulk Terminal	--	--	1,918	--	--	--	11,010	--	--	--	--	--	17,095	73	431	30,527
Pipeline	--	--	2,036	--	--	--	4,216	--	--	--	--	--	2,636	170	0	9,058
Natural Gas Processing Plant	83	22	105	518	18	832	1,368	384	781	239	22	49	1,475	65	87	3,100
Total	--	--	4,754	--	--	--	18,117	--	--	--	--	--	23,862	385	674	47,792
Normal Butane																
Refinery	189	8	197	514	46	325	885	442	575	1,134	7	9	2,167	162	295	3,706
Bulk Terminal	--	--	429	--	--	--	1,846	--	--	--	--	--	5,920	0	966	9,161
Pipeline	--	--	109	--	--	--	1,066	--	--	--	--	--	786	88	0	2,049
Natural Gas Processing Plant	35	7	42	25	8	260	293	207	465	523	24	27	1,246	35	10	1,626
Total	--	--	777	--	--	--	4,090	--	--	--	--	--	10,119	285	1,271	16,542
Isobutane																
Refinery	72	0	72	227	46	140	413	285	677	294	14	7	1,277	84	68	1,914
Bulk Terminal	--	--	2	--	--	--	1,671	--	--	--	--	--	4,608	0	241	6,522
Pipeline	--	--	0	--	--	--	448	--	--	--	--	--	330	47	0	825
Natural Gas Processing Plant	4	6	10	19	0	86	105	52	356	679	15	10	1,112	5	6	1,238
Total	--	--	84	--	--	--	2,637	--	--	--	--	--	7,327	136	315	10,499
Other Hydrocarbons and Alcohol																
Refinery	20	0	20	136	3	47	186	1	144	45	0	3	193	14	14	427
Total	--	--	20	--	--	--	186	--	--	--	--	--	193	14	14	427
Unfinished Oils																
Refinery																
Naphthas and Lighter	3,273	269	3,542	2,262	103	885	3,250	632	6,887	4,059	135	41	11,754	724	4,575	23,845
Kerosene and Light Gas Oils	2,941	150	3,091	1,475	61	497	2,033	363	5,402	2,491	154	2	8,412	259	3,404	17,199
Heavy Gas Oils	3,795	220	4,015	3,090	209	1,920	5,219	619	6,342	6,402	433	123	13,919	967	9,654	33,774
Residuum	943	132	1,075	2,101	2	1,275	3,378	456	4,710	3,265	94	0	8,525	372	5,017	18,367
Total	10,952	771	11,723	8,928	375	4,577	13,880	2,070	23,341	16,217	816	166	42,610	2,322	22,650	93,185

See footnotes at end of table.

Table 18. Stocks of Crude Oil and Petroleum Products by PAD District, December 31, 1987 (continued)
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky.	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Motor Gasoline Blending Components																
Refinery	5,234	112	5,346	5,034	655	1,636	7,325	1,714	6,435	5,772	225	231	14,377	1,697	7,528	36,273
Bulk Terminal	--	--	159	--	--	--	330	--	--	--	--	--	546	27	5	1,067
Pipeline	--	--	0	--	--	--	32	--	--	--	--	--	0	0	0	32
Total	--	--	5,505	--	--	--	7,687	--	--	--	--	--	14,923	1,724	7,533	37,372
Aviation Gasoline Blending Components																
Refinery	0	0	0	152	0	4	156	0	0	69	0	0	69	0	31	256
Total	--	--	0	--	--	--	156	--	--	--	--	--	69	0	31	256
Total Finished Motor Gasoline																
Refinery	8,863	370	9,233	5,783	1,337	3,025	10,145	1,881	11,861	5,764	1,213	200	20,919	2,078	8,608	50,983
Bulk Terminal	--	--	35,537	--	--	--	27,637	--	--	--	--	--	10,011	1,776	11,046	86,007
Pipeline	--	--	12,699	--	--	--	15,715	--	--	--	--	--	20,036	1,201	2,170	51,821
Total	--	--	57,469	--	--	--	53,497	--	--	--	--	--	50,966	5,055	21,824	188,811
Finished Leaded Motor Gasoline																
Refinery	1,604	181	1,785	1,681	429	1,172	3,282	702	2,927	1,230	200	86	5,145	793	2,738	13,743
Bulk Terminal	--	--	8,570	--	--	--	9,699	--	--	--	--	--	3,410	827	4,285	26,791
Pipeline	--	--	2,427	--	--	--	4,854	--	--	--	--	--	4,221	574	507	12,583
Total	--	--	12,782	--	--	--	17,835	--	--	--	--	--	12,776	2,194	7,530	53,117
Finished Unleaded Motor Gasoline																
Refinery	7,259	189	7,448	4,102	908	1,853	6,863	1,179	8,934	4,534	1,013	114	15,774	1,285	5,870	37,240
Bulk Terminal	--	--	26,967	--	--	--	17,938	--	--	--	--	--	6,601	949	6,761	59,216
Pipeline	--	--	10,272	--	--	--	10,861	--	--	--	--	--	15,815	627	1,663	39,238
Total	--	--	44,687	--	--	--	35,662	--	--	--	--	--	38,190	2,861	14,294	135,694
Finished Aviation Gasoline																
Refinery	119	0	119	67	38	16	121	100	332	130	0	0	562	33	128	963
Bulk Terminal	--	--	377	--	--	--	523	--	--	--	--	--	47	21	302	1,270
Pipeline	--	--	0	--	--	--	51	--	--	--	--	--	47	0	0	98
Total	--	--	496	--	--	--	695	--	--	--	--	--	656	54	430	2,331

See footnotes at end of table.

Table 18. Stocks of Crude Oil and Petroleum Products by PAD District, December 31, 1987 (continued)
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky.	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Naphtha-Type Jet Fuel																
Refinery	466	0	466	290	32	193	515	364	631	490	57	138	1,680	281	785	3,727
Bulk Terminal	--	--	893	--	--	--	577	--	--	--	--	--	549	6	575	2,600
Pipeline	--	--	202	--	--	--	235	--	--	--	--	--	604	143	445	1,629
Total	--	--	1,561	--	--	--	1,327	--	--	--	--	--	2,833	430	1,805	7,956
Kerosene-Type Jet Fuel																
Refinery	2,082	24	2,106	1,507	183	528	2,218	374	3,455	2,943	60	52	6,884	414	3,919	15,541
Bulk Terminal	--	--	4,208	--	--	--	3,583	--	--	--	--	--	1,661	240	2,519	12,211
Pipeline	--	--	3,977	--	--	--	3,061	--	--	--	--	--	6,174	182	827	14,221
Total	--	--	10,291	--	--	--	8,862	--	--	--	--	--	14,719	836	7,265	41,973
Kerosene																
Refinery	281	93	374	664	102	276	1,042	112	646	527	44	0	1,329	62	199	3,006
Bulk Terminal	--	--	2,793	--	--	--	1,418	--	--	--	--	--	233	30	41	4,515
Pipeline	--	--	170	--	--	--	247	--	--	--	--	--	490	0	19	926
Total	--	--	3,337	--	--	--	2,707	--	--	--	--	--	2,052	92	259	8,447
Distillate Fuel Oils																
Refinery	7,921	501	8,422	5,496	1,624	3,184	10,304	1,109	8,381	4,980	1,079	114	15,663	1,635	4,741	40,765
Bulk Terminal	--	--	37,177	--	--	--	16,298	--	--	--	--	--	5,985	878	5,371	65,709
Pipeline	--	--	8,155	--	--	--	8,040	--	--	--	--	--	9,862	585	1,362	28,004
Natural Gas Processing Plant	0	0	0	0	0	0	0	0	4	3	0	0	7	0	0	7
Total	--	--	53,754	--	--	--	34,642	--	--	--	--	--	31,517	3,098	11,474	134,485
Residual Fuel Oils																
Refinery	3,187	67	3,254	1,465	285	226	1,976	272	3,724	2,355	209	17	6,577	387	6,252	18,446
Bulk Terminal	--	--	19,865	--	--	--	1,062	--	--	--	--	--	5,915	0	1,924	26,766
Pipeline	--	--	0	--	--	--	0	--	--	--	--	--	60	0	138	198
Total	--	--	23,119	--	--	--	3,038	--	--	--	--	--	12,552	387	8,314	47,410
Naphtha < 400 Deg. Petro. Feed. Use																
Refinery	358	0	358	326	0	81	407	64	1,012	287	8	10	1,381	29	162	2,337
Total	358	0	358	326	0	81	407	64	1,012	287	8	10	1,381	29	162	2,337
Other Oils > 400 Deg. Petro. Feed. Use																
Refinery	6	0	6	9	0	0	9	100	1,140	214	0	0	1,454	4	128	1,601
Total	6	0	6	9	0	0	9	100	1,140	214	0	0	1,454	4	128	1,601

See footnotes at end of table.

Table 18. Stocks of Crude Oil and Petroleum Products by PAD District, December 31, 1987 (continued)
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky. *	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Special Naphthas																
Refinery	581	46	627	209	0	102	311	87	1,154	56	190	0	1,487	7	155	2,587
Bulk Terminal	--	--	659	--	--	--	334	--	--	--	--	--	48	0	26	1,067
Total	--	--	1,286	--	--	--	645	--	--	--	--	--	1,535	7	181	3,654
Lubricants																
Refinery	321	816	1,137	918	0	204	1,122	26	4,233	1,352	433	0	6,044	108	953	9,364
Bulk Terminal	--	--	1,827	--	--	--	1,003	--	--	--	--	--	466	2	609	3,907
Total	--	--	2,964	--	--	--	2,125	--	--	--	--	--	6,510	110	1,562	13,271
Waxes																
Refinery	0	64	64	78	0	21	99	42	222	149	16	0	429	87	104	783
Total	--	--	64	--	--	--	99	--	--	--	--	--	429	87	104	783
Petroleum Coke																
Refinery	520	0	520	360	382	133	875	5	431	2,770	211	0	3,417	31	1,907	6,750
Total	520	0	520	360	382	133	875	5	431	2,770	211	0	3,417	31	1,907	6,750
Asphalt and Road Oil																
Refinery	1,186	229	1,415	2,367	1,174	1,088	4,629	600	850	596	1,166	150	3,362	1,371	2,165	12,942
Bulk Terminal	--	--	2,524	--	--	--	2,676	--	--	--	--	--	433	44	180	5,857
Total	--	--	3,939	--	--	--	7,305	--	--	--	--	--	3,795	1,415	2,345	18,799
Miscellaneous Products																
Refinery	136	44	180	172	14	14	200	52	476	320	1	0	849	20	251	1,500
Bulk Terminal	--	--	563	--	--	--	118	--	--	--	--	--	561	1	547	1,790
Pipeline	--	--	0	--	--	--	191	--	--	--	--	--	261	0	71	523
Natural Gas Processing Plant	0	0	0	0	0	0	0	25	0	1	2	0	28	0	0	28
Total	--	--	743	--	--	--	509	--	--	--	--	--	1,699	21	869	3,841
Total Stocks, All Oils	--	--	**198,360**	--	--	--	**244,226**	--	--	--	--	--	**954,054**	**29,334**	**181,477**	**1,607,451**

[1] Includes 38,395 thousand barrels of domestic crude oil.
* Effective January 1987 "Appalachian #2" is combined with "Ind., Ill., Ky.".
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 19. Refinery and Bulk Terminal Stocks of Selected Petroleum Products by State, December 31, 1987
(Thousand Barrels)

State	Leaded Motor Gasoline	Unleaded Motor Gasoline	Kerosene	Distillate Fuel Oil	Residual Fuel Oil
PAD District I Total	**10,355**	**34,415**	**3,167**	**45,599**	**23,119**
Connecticut	448	1,331	172	1,995	334
Delaware, D.C., Maryland	329	1,944	232	2,555	1,516
Florida	1,216	5,227	258	1,853	1,115
Georgia	813	1,872	98	1,202	263
Maine, New Hampshire, Vermont	346	917	199	2,232	445
Massachusetts	340	1,111	96	3,367	2,028
New Jersey	1,466	7,663	178	13,611	9,311
New York	1,192	3,342	405	6,039	4,698
North Carolina	997	1,684	412	1,574	404
Pennsylvania	1,722	5,037	694	5,966	1,771
Rhode Island	120	551	w	1,269	w
South Carolina	564	1,240	195	983	w
Virginia	694	2,350	196	2,834	772
West Virginia	108	126	w	117	w
PAD District II Total	**12,981**	**24,601**	**2,460**	**26,602**	**3,038**
Illinois	2,533	5,101	315	4,420	1,081
Indiana	1,461	3,193	409	3,467	368
Iowa	699	1,083	w	1,277	w
Kansas, Nebraska	1,065	1,642	17	2,761	64
Kentucky	754	837	95	1,232	w
Michigan	1,104	2,690	229	2,507	139
Minnesota	816	1,307	w	1,951	273
Missouri	455	807	w	818	w
North & South Dakota	350	535	w	866	w
Ohio	1,452	3,248	903	2,621	259
Oklahoma	938	1,559	w	2,075	210
Tennessee	774	1,295	68	1,032	246
Wisconsin	560	1,504	w	1,555	64
PAD District III Total	**8,555**	**22,375**	**1,562**	**21,648**	**12,492**
Alabama	541	928	151	900	657
Arkansas	201	261	w	250	w
Louisiana	1,339	4,301	511	4,813	4,512
Mississippi	731	2,150	13	2,154	w
New Mexico	169	214	w	299	17
Texas	5,574	14,521	869	13,232	6,937
PAD District IV Total	**1,620**	**2,234**	**92**	**2,513**	**387**
Colorado	352	672	w	469	w
Idaho	214	150	w	188	w
Montana	462	591	w	770	80
Utah	261	274	w	434	95
Wyoming	331	547	w	652	w
PAD District V Total	**7,023**	**12,631**	**240**	**10,112**	**8,176**
Alaska	421	464	w	1,118	w
Arizona	298	406	w	256	w
California	3,626	8,531	134	5,418	5,954
Hawaii	101	406	w	453	w
Nevada	133	220	w	137	w
Oregon	813	794	w	1,101	193
Washington	1,631	1,810	w	1,629	952
United States Total	**40,534**	**96,456**	**7,521**	**106,474**	**47,212**

w = Withheld to avoid disclosure of individual company data.

Table 20. Movements of Crude Oil and Petroleum Products by Pipeline, Tanker, and Barge Between PAD Districts, 1987
(Thousand Barrels)

Commodity	From I to			From II to				From III to				From IV to			From V to		From V to	
	II	III	V	I	III	IV	V	I	II	IV	V	II	III	V	I	II	III	IV
Crude Oil	**483**	**0**	**0**	**1,613**	**27,291**	**7,338**	**0**	**3,789**	**517,732**	**0**	**0**	**72,253**	**21,468**	**0**	**16,882**	**0**	**203,835**	**0**
Petroleum Products	**82,212**	**1,980**	**0**	**51,782**	**71,602**	**25,626**	**0**	**941,271**	**318,040**	**0**	**21,880**	**17,308**	**12,139**	**15,056**	**0**	**0**	**425**	**0**
Pentanes Plus	0	0	0	0	2,959	0	0	0	10,498	0	0	907	1,385	0	0	0	0	0
Liquefied Petroleum Gases	0	0	0	9,851	40,089	1,152	0	23,221	53,596	0	0	7,000	10,754	0	0	0	0	0
Unfinished Oils	0	393	0	0	0	0	0	2,102	82	0	620	0	0	0	0	0	0	0
Blending Components																		
Motor Gasoline	302	109	0	1,731	21	0	0	1,663	372	0	22	0	0	0	0	0	0	0
Aviation Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finished Motor Gasoline	55,962	0	0	26,581	16,511	12,737	0	543,184	153,211	0	11,301	5,359	0	10,157	0	0	0	0
Finished Leaded Motor Gasoline	15,290	0	0	5,771	5,126	3,784	0	102,357	39,452	0	4,000	2,504	0	5,066	0	0	0	0
Finished Unleaded Motor Gasoline	40,672	0	0	20,810	11,385	8,953	0	440,827	113,759	0	7,301	2,855	0	5,091	0	0	0	0
Finished Aviation Gasoline	88	0	0	0	0	171	0	2,002	1,335	0	0	0	0	0	0	0	0	0
Naphtha-Type Jet Fuel	0	0	0	0	137	0	0	5,541	320	0	3,324	913	0	1,185	0	0	0	0
Kerosene-Type Jet Fuel	3,184	0	0	2,272	1,507	8,899	0	118,020	35,253	0	1,694	57	0	677	0	0	0	0
Kerosene	392	0	0	368	1,186	0	0	6,948	171	0	0	0	0	0	0	0	0	0
Distillate Fuel Oil	21,538	0	0	7,270	5,164	2,667	0	217,372	52,580	0	4,339	3,072	0	3,037	0	0	0	0
Residual Fuel Oil	0	43	0	488	3,613	0	0	6,101	428	0	0	0	0	0	0	0	0	0
Naphtha and Other Oils for Petro. Feed. Use	683	212	0	368	167	0	0	214	328	0	0	0	0	0	0	0	0	0
Special Naphthas	0	22	0	0	46	0	0	3,259	1,586	0	34	0	0	0	0	0	0	0
Lubricants	63	828	0	1,033	97	0	0	6,212	4,224	0	546	0	0	0	0	0	425	0
Waxes	0	0	0	0	0	0	0	63	0	0	0	0	0	0	0	0	0	0
Asphalt and Road Oil	0	248	0	1,740	105	0	0	4,552	3,771	0	0	0	0	0	0	0	0	0
Miscellaneous Products	0	125	0	80	0	0	0	817	285	0	0	0	0	0	0	0	0	0
Total	**82,695**	**1,980**	**0**	**53,395**	**98,893**	**32,964**	**0**	**945,060**	**835,772**	**0**	**21,880**	**89,561**	**33,607**	**15,056**	**16,882**	**0**	**204,260**	**0**

Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 21. Movements of Crude Oil and Petroleum Products by Pipeline Between PAD Districts, 1987
(Thousand Barrels)

Commodity	From I to		From II to			From III to				From IV to			From V to	
	II	III	I	III	IV	I	II	IV	V	II	III	V	III	IV
Crude Oil	**0**	**0**	**452**	**27,291**	**7,338**	**0**	**517,670**	**0**	**0**	**72,253**	**21,468**	**0**	**7,242**	**0**
Petroleum Products	**81,018**	**0**	**29,402**	**67,438**	**25,626**	**755,574**	**267,915**	**0**	**20,461**	**17,308**	**12,139**	**15,056**	**0**	**0**
Pentanes Plus	0	0	0	2,959	0	0	10,498	0	0	907	1,385	0	0	0
Liquefied Petroleum Gases	0	0	9,851	39,974	1,152	20,420	53,547	0	0	7,000	10,754	0	0	0
Blending Components														
Motor Gasoline	0	0	1,731	0	0	0	0	0	0	0	0	0	0	0
Aviation Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finished Motor Gasoline	55,944	0	14,709	16,511	12,737	440,853	130,819	0	11,301	5,359	0	10,157	0	0
Finished Leaded Motor Gasoline	15,290	0	2,788	5,126	3,784	85,176	32,390	0	4,000	2,504	0	5,066	0	0
Finished Unleaded Motor Gasoline	40,654	0	11,921	11,385	8,953	355,677	98,429	0	7,301	2,855	0	5,091	0	0
Finished Aviation Gasoline	88	0	0	0	171	486	1,224	0	0	0	0	0	0	0
Naphtha-Type Jet Fuel	0	0	0	137	0	2,730	320	0	3,324	913	0	1,185	0	0
Kerosene-Type Jet Fuel	3,184	0	1,195	1,507	8,899	98,983	31,085	0	1,694	57	0	677	0	0
Kerosene	392	0	0	1,186	0	6,648	137	0	0	0	0	0	0	0
Distillate Fuel Oil	21,410	0	1,916	5,164	2,667	185,452	40,285	0	4,142	3,072	0	3,037	0	0
Residual Fuel Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous Products	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**81,018**	**0**	**29,854**	**94,729**	**32,964**	**755,574**	**785,585**	**0**	**20,461**	**89,561**	**33,607**	**15,056**	**7,242**	**0**

Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 22. Movements of Crude Oil and Petroleum Products by Tanker and Barge Between PAD Districts, 1987
(Thousand Barrels)

Commodity	From I to			From II to			From III to						From V to		
	II	III	V	I	III	V	I	New Eng	Cent Atl	Low Atl	II	V	I	II	III
Crude Oil	**483**	**0**	**0**	**1,161**	**0**	**0**	**3,789**	**0**	**3,789**	**0**	**62**	**0**	**16,882**	**0**	**196,593**
Petroleum Products	**1,194**	**1,980**	**0**	**22,380**	**4,164**	**0**	**185,697**	**1,989**	**24,388**	**159,320**	**50,125**	**1,419**	**0**	**0**	**425**
Liquefied Petroleum Gases	0	0	0	0	115	0	2,801	0	0	2,801	49	0	0	0	0
Unfinished Oils	0	393	0	0	0	0	2,102	0	842	1,260	82	620	0	0	0
Motor Gasoline Blending Components	302	109	0	0	21	0	1,663	0	1,549	114	372	22	0	0	0
Finished Motor Gasoline	18	0	0	11,672	0	0	102,331	328	2,440	99,563	22,392	0	0	0	0
Finished Leaded Motor Gasoline	0	0	0	2,983	0	0	17,181	72	287	16,822	7,062	0	0	0	0
Finished Unleaded Motor Gasoline	18	0	0	8,889	0	0	85,150	256	2,153	82,741	15,330	0	0	0	0
Finished Aviation Gasoline	0	0	0	0	0	0	1,514	0	708	806	111	0	0	0	0
Naphtha-Type Jet Fuel	0	0	0	0	0	0	2,811	0	0	2,811	0	0	0	0	0
Kerosene-Type Jet Fuel	0	0	0	1,077	0	0	19,037	0	635	18,402	4,168	0	0	0	0
Kerosene	0	0	0	368	0	0	300	0	152	148	34	0	0	0	0
Distillate Fuel Oil	126	0	0	5,354	0	0	31,920	707	8,035	23,178	12,295	197	0	0	0
Residual Fuel Oil	0	43	0	486	3,613	0	6,101	945	2,803	2,353	426	0	0	0	0
Naphtha and Other Oils for Petro. Feed. Use	683	212	0	368	167	0	214	9	20	185	328	0	0	0	0
Special Naphthas	0	22	0	0	46	0	3,259	0	1,396	1,863	1,586	34	0	0	0
Lubricants	63	626	0	1,033	97	0	6,212	0	5,019	1,193	4,224	546	0	0	425
Waxes	0	0	0	0	0	0	63	0	63	0	0	0	0	0	0
Asphalt and Road Oil	0	246	0	1,740	105	0	4,552	0	132	4,420	3,771	0	0	0	0
Miscellaneous Products	0	125	0	80	0	0	817	0	594	223	285	0	0	0	0
Total	**1,677**	**1,980**	**0**	**23,541**	**4,164**	**0**	**189,486**	**1,989**	**28,177**	**159,320**	**50,187**	**1,419**	**16,882**	**0**	**197,018**

Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 23. Net Movements of Crude Oil and Petroleum Products by Pipeline, Tanker, and Barge Between PAD Districts, 1987
(Thousand Barrels)

Commodity	PAD District I			PAD District II			PAD District III			PAD District IV			PAD District V		
	Receipts into PADD I	Shipments from PADD I	Net Receipts PADD I	Receipts into PADD II	Shipments from PADD II	Net Receipts PADD II	Receipts into PADD III	Shipments from PADD III	Net Receipts PADD III	Receipts into PADD IV	Shipments from PADD IV	Net Receipts PADD IV	Receipts into PADD V	Shipments from PADD V	Net Receipts PADD V
Crude Oil	**22,284**	**483**	**21,801**	**590,468**	**36,242**	**554,226**	**252,594**	**521,521**	**-268,927**	**7,338**	**93,721**	**-86,383**	**0**	**220,717**	**-220,717**
Petroleum Products	**993,053**	**84,192**	**908,861**	**417,560**	**149,010**	**268,550**	**86,146**	**1,281,191**	**-1,195,045**	**25,626**	**44,503**	**-18,877**	**36,936**	**425**	**36,511**
Pentanes Plus	0	0	0	11,405	2,959	8,446	4,344	10,498	-6,154	0	2,292	-2,292	0	0	0
Liquefied Petroleum Gases	33,072	0	33,072	60,596	51,092	9,504	50,843	76,817	-25,974	1,152	17,754	-16,602	0	0	0
Unfinished Oils	2,102	393	1,709	82	0	82	393	2,804	-2,411	0	0	0	620	0	620
Blending Components															
Motor Gasoline	3,394	411	2,983	674	1,752	-1,078	130	2,057	-1,927	0	0	0	22	0	22
Aviation Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finished Motor Gasoline	569,765	55,962	513,803	214,532	55,829	158,703	16,511	707,696	-691,185	12,737	15,516	-2,779	21,458	0	21,458
Finished Leaded Motor Gasoline	108,128	15,290	92,838	57,246	14,681	42,565	5,126	145,809	-140,683	3,784	7,570	-3,786	9,066	0	9,066
Finished Unleaded Motor Gasoline	461,637	40,672	420,965	157,286	41,148	116,138	11,385	561,887	-550,502	8,953	7,946	1,007	12,392	0	12,392
Finished Aviation Gasoline	2,002	88	1,914	1,423	171	1,252	0	3,337	-3,337	171	0	171	0	0	0
Naphtha-Type Jet Fuel	5,541	0	5,541	1,233	137	1,096	137	9,185	-9,048	0	2,098	-2,098	4,509	0	4,509
Kerosene-Type Jet Fuel	120,292	3,184	117,108	38,494	12,678	25,816	1,507	154,967	-153,460	8,899	734	8,165	2,371	0	2,371
Kerosene	7,316	392	6,924	583	1,554	-991	1,186	7,119	-5,933	0	0	0	0	0	0
Distillate Fuel Oil	224,642	21,538	203,104	77,190	15,101	62,089	5,164	274,291	-269,127	2,667	6,109	-3,442	7,376	0	7,376
Residual Fuel Oil	6,589	43	6,546	428	4,101	-3,673	3,656	6,529	-2,873	0	0	0	0	0	0
Naphtha and Other Oils for Petro. Feed. Use	582	895	-313	1,011	535	476	379	542	-163	0	0	0	0	0	0
Special Naphthas	3,259	22	3,237	1,586	46	1,540	68	4,879	-4,811	0	0	0	34	0	34
Lubricants	7,245	891	6,354	4,287	1,130	3,157	1,350	10,982	-9,632	0	0	0	546	425	121
Waxes	63	0	63	0	0	0	0	63	-63	0	0	0	0	0	0
Asphalt and Road Oil	6,292	248	6,044	3,771	1,845	1,926	393	8,323	-7,970	0	0	0	0	0	0
Miscellaneous Products	897	125	772	285	80	205	125	1,102	-977	0	0	0	0	0	0
Total	**1,015,337**	**84,675**	**930,662**	**1,008,028**	**185,252**	**822,776**	**338,740**	**1,802,712**	**-1,463,972**	**32,964**	**138,224**	**-105,260**	**36,936**	**221,142**	**-184,206**

Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 24. Production of Residual Fuel Oil by Sulfur Content by PAD District, 1987
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky. *	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Residual Fuel Oil	**48,579**	**1,466**	**50,045**	**19,968**	**2,423**	**1,894**	**24,285**	**6,075**	**61,028**	**40,480**	**2,700**	**146**	**110,429**	**3,685**	**134,757**	**323,201**
0.00 to 0.30% Sulfur	9,341	332	9,673	1,020	0	2	1,022	885	2,397	10,158	742	76	14,258	611	12,016	37,580
0.31 to 1.00% Sulfur	29,535	135	29,670	4,885	13	1,292	6,190	3,987	13,283	3,481	1,361	70	22,182	99	22,924	81,065
Greater Than 1.00% Sulfur	9,703	999	10,702	14,063	2,410	600	17,073	1,203	45,348	26,841	597	0	73,989	2,975	99,817	204,556

* Effective January 1987 "Appalachian #2" is combined with "Ind., Ill., Ky.".
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 25. Stocks of Residual Fuel Oil by Sulfur Content by PAD District, December 31, 1987
(Thousand Barrels)

Commodity	PAD District I			PAD District II				PAD District III						PAD Dist. IV	PAD Dist. V	United States
	East Coast	Appalachian #1	Total	Ind., Ill., Ky. *	Minn., Wisc., Daks.	Okla., Kans., Mo.	Total	Texas Inland	Texas Gulf Coast	La. Gulf Coast	No. La., Ark.	New Mexico	Total	Rocky Mt.	West Coast	
Residual Fuel Oil -- 0.00 to 0.30% Sulfur																
Refinery	277	43	320	51	0	0	51	61	303	535	4	10	913	60	435	1,779
Bulk Terminal	--	--	6,375	--	--	--	176	--	--	--	--	--	0	0	0	6,551
Total	**--**	**--**	**6,695**	**--**	**--**	**--**	**227**	**--**	**--**	**--**	**--**	**--**	**913**	**60**	**435**	**8,330**
Residual Fuel Oil -- 0.31 to 1.00% Sulfur																
Refinery	1,790	24	1,814	322	4	137	463	54	871	213	114	7	1,259	26	515	4,077
Bulk Terminal	--	--	7,128	--	--	--	220	--	--	--	--	--	2,720	0	281	10,349
Total	**--**	**--**	**8,942**	**--**	**--**	**--**	**683**	**--**	**--**	**--**	**--**	**--**	**3,979**	**26**	**796**	**14,426**
Residual Fuel Oil -- Greater than 1.00% Sulfur																
Refinery	1,120	0	1,120	1,092	281	89	1,462	157	2,550	1,607	91	0	4,405	301	5,302	12,590
Bulk Terminal	--	--	6,362	--	--	--	666	--	--	--	--	--	3,195	0	1,643	11,866
Total	**--**	**--**	**7,482**	**--**	**--**	**--**	**2,128**	**--**	**--**	**--**	**--**	**--**	**7,600**	**301**	**6,945**	**24,456**

* Effective January 1987 "Appalachian #2" is combined with "Ind., Ill., Ky.".
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 26. Movements of Residual Fuel Oil by Tanker and Barge Between PAD Districts, by Sulfur Content, 1987
(Thousand Barrels)

Commodity	From I to			From II to			From III to						From V to		
	II	III	V	I	III	V	I	New Eng	Cent Atl	Low Atl	II	V	I	II	III
Residual Fuel Oil	**0**	**43**	**0**	**486**	**3,613**	**0**	**6,101**	**945**	**2,803**	**2,353**	**428**	**0**	**0**	**0**	**0**
0.00 to 0.30% Sulfur	0	0	0	0	0	0	503	0	169	334	0	0	0	0	0
0.31 to 1.00% Sulfur	0	0	0	0	199	0	884	325	0	559	32	0	0	0	0
Greater Than 1.00% Sulfur	0	43	0	488	3,414	0	4,714	620	2,634	1,460	396	0	0	0	0

Sources and estimation procedures: See Explanatory Notes 1 and 2.

Table 27. Imports of Residual Fuel Oil by Sulfur Content by Country of Origin, 1987
(Thousand Barrels)

Country	Residual Fuel Oil			
	0.00 to 0.30%	0.31 to 1.00%	Greater Than 1.00%	Total
Arab OPEC				
Algeria	21,974	749	433	23,156
Iraq	0	0	0	0
Kuwait	10	0	0	10
Libya	0	0	0	0
Qatar	0	0	0	0
Saudi Arabia	504	0	653	1,157
United Arab Emirates	0	0	0	0
Subtotal Arab OPEC	22,488	749	1,086	24,323
Other OPEC				
Ecuador	0	0	2,118	2,118
Gabon	0	0	0	0
Indonesia	3,413	25	31	3,469
Iran	0	0	0	0
Nigeria	838	208	0	1,046
Venezuela	1,229	254	24,295	25,778
Subtotal Other OPEC	5,480	487	26,444	32,411
Other				
Angola	4,140	0	0	4,140
Australia	643	590	63	1,296
Bahamas	615	2,076	9,561	12,252
Bolivia	0	0	0	0
Brazil	4,897	1,719	22	6,638
Brunei	0	0	0	0
Canada	841	560	6,229	7,630
China, People's Republic	0	0	0	0
Congo	1,311	127	0	1,438
Egypt	0	0	0	0
France	0	356	0	356
Ghana	415	0	0	415
Liberia	0	0	0	0
Malaysia	120	0	0	120
Mexico	0	0	4,534	4,534
Netherlands	274	3,442	335	4,051
Netherlands Antilles	415	1,354	4,657	6,426
Norway	0	618	380	998
Oman	0	0	0	0
Peru	405	353	8,515	9,273
Puerto Rico	0	0	0	0
Romania	0	194	803	997
Spain	138	626	5,618	6,382
Syria	0	0	1,000	1,000
Trinidad	0	0	9,580	9,580
Tunisia	0	183	0	183
United Kingdom	0	2,226	2,860	5,086
Virgin Islands	4,634	12,701	16,805	34,140
Yugoslavia	0	0	0	0
Zaire	0	0	0	0
Other Western Hemisphere	1,475	604	11,668	13,747
Other Eastern Hemisphere	9,243	6,185	3,294	18,722
Subtotal Other	29,566	33,914	85,924	149,404
Total Imports	**57,534**	**35,150**	**113,454**	**206,138**

Sources and estimation procedures: See Explanatory Notes 1 and 2

Table 28. Imports of Residual Fuel Oil by Sulfur Content by State of Entry, 1987
(Thousand Barrels)

State	Residual Fuel Oil			
	0.00 to 0.30%	0.31 to 1.00%	Greater Than 1.00%	Total
PAD District I	**50,805**	**34,044**	**107,488**	**192,337**
Connecticut	204	883	394	1,481
Delaware	0	613	676	1,289
Florida	0	3,215	9,265	12,480
Georgia	0	0	930	930
Maine	436	1,592	8,277	10,305
Maryland	398	1,792	3,525	5,715
Massachusetts	687	5,299	19,032	25,018
New Hampshire	0	232	1,142	1,374
New Jersey	13,863	3,291	13,122	30,276
New York	33,488	7,532	34,522	75,542
North Carolina	0	0	3,976	3,976
Pennsylvania	1,678	3,927	4,840	10,445
Rhode Island	0	911	156	1,067
South Carolina	0	56	1,975	2,031
Vermont	1	1	151	153
Virginia	50	4,700	5,505	10,255
PAD District II	**276**	**369**	**671**	**1,316**
Michigan	274	368	170	812
Minnesota	0	0	34	34
North Dakota	2	1	403	406
Ohio	0	0	14	14
Wisconsin	0	0	50	50
PAD District III	**4,154**	**615**	**4,933**	**9,702**
Alabama	0	0	1,621	1,621
Louisiana	0	0	1,745	1,745
Texas	4,154	615	1,567	6,336
PAD District IV	**0**	**0**	**10**	**10**
Montana	0	0	10	10
PAD District V	**2,299**	**122**	**352**	**2,773**
California	184	70	0	254
Hawaii	2,115	52	312	2,479
Washington	0	0	40	40
All PAD Districts	**57,534**	**35,150**	**113,454**	**206,138**

Note: Total may not equal sum of components due to independent rounding.
Sources and estimation procedures: See Explanatory Notes 1 and 2.

Refinery Capacity

U.S. Refinery Capacity: 1988

by Nancy A. Masterson

Highlights

U.S. operable crude oil distillation capacity was 15.9 million barrels per calendar day as of January 1, 1988, compared with 15.6 million barrels per calendar day a year earlier. This is the second consecutive year in which crude oil distillation capacity surpassed the previous year's figure and represents a reversal of the downward trend experienced during 1981 through 1986. However, the number of refineries in operation decreased to 213, as refinery closings during 1987 outnumbered reactivations. Other highlights for 1987 include the following:

- Gross inputs to crude distillation units increased to 13.0 million barrels per day. This was 1.4 percent above the 1986 level.
- Downstream processes showed moderate increases in capacities as of January 1, 1988; in particular, thermal cracking increased by nearly 8 percent over the previous year.
- Processes associated with gasoline production showed increases in capacities as of January 1, 1988; in particular, the capacity for isomer production was nearly 43 percent above the January 1, 1987 level.

Distillation Capacity and Utilization Rates

There were 213 refineries in operation on January 1, 1988, compared with 219 refineries on January 1, 1987 (Table FE8). According to responses to the Form EIA-820, "Annual Refinery Report," total crude oil distillation capacity was 15.9 million barrels per calendar day as of January 1, 1988, compared with 15.6 million barrels per calendar day a year earlier. During 1987, nine refineries were shut down, and four refineries were reactivated (Table FE9). One refinery was purchased by Texaco Refining and Marketing Inc., and its operations merged with Texaco's Bakersfield

Table FE8. Number and Capacity of Operable Crude Oil Distillation Units at Petroleum Refineries as of January 1

Year	Number of Operable Refineries		Capacity of Operable Refineries (barrels per calendar day)	
	Number	Change From Previous Year	Capacity	Change From Previous Year
1980	319	+8	17,988,121	+547,236
1981	324	+5	18,620,520	+632,399
1982	301	-23	17,889,734	-730,786
1983	258	-43	16,859,337	-1,030,397
1984	247	-11	16,137,141	-722,196
1985	223	-24	15,658,769	-478,372
1986	216	-7	15,458,948	-199,821
1987[1]	219	+3	15,565,513	+106,565
1988	213	-6	15,915,418	+349,905

[1] Beginning in 1987, the Hawaiian Independent Refinery (66,000 barrels per calendar day distillation capacity) is included in U.S. totals.
Source: Energy Information Administration, Form EIA-820, *Annual Refinery Report*.

Note: Unless otherwise indicated, data in this article were taken from the Summary Statistics Section and Refinery Capacity section of this report, *Petroleum Supply Annual*, DOE/EIA-0340(87)1; *Petroleum Supply Annual*, 1981, 1982, 1983, 1984, 1985, and 1986, DOE/EIA-0340, Volumes 1 and 2.

refinery. All four of the reactivations are located in the Gulf Coast area. There were no new refineries activated during 1987.

The reactivated refineries provided 337,750 barrels per calendar day of operable crude oil distillation capacity. This additional capacity is attributed almost entirely to Trans America Refining Company's Good Hope, Louisiana refinery, which became operable in November 1987. This refinery, with a capacity of 300,000 barrels per calendar day, was reported as idle on January 1, 1988. The reactivation of this refinery more than offset the operable distillation capacity of the nine refineries (66,500 barrels per calendar day) that closed in 1987. While closings and reactivations resulted in a net gain in operable distillation capacity of 271,250 barrels per calendar day, upgrading within operating refineries during this period provided an additional 78,655 barrels per calendar day.

Table FE9. Refinery Closings and Reactivations During 1987

Refinery	Location	Crude Oil Distillation Capacity (barrels per calendar day)	Downstream Capacity (barrels per stream day)	Operating History (years in operation)
Closings:				
Beacon Oil Co.	Hanford, California	17,300	11,380	27
Clark Oil & Refining Corp.	Mt. Airy, Louisiana	0	27,000	39
Flying J. Petroleum, Inc.	Williston, North Dakota	4,600	5,450	32
Lakeside Refining Co.	Kalamazoo, Michigan	5,600	0	39
MacMillan Petroleum Co.	Norphlet, Arkansas	5,800	2,700	39
Sabre Refining Inc.	Bakersfield, California	10,000	0	16
Silver Eagle Oil Co.	La Barge, Wyoming	3,000	0	13
Virginia Oil & Refining Co., Inc.	Jonesville, Virginia	1,000	0	2
Western Oil & Refining	Long Beach, California	19,200	0	11
Total		66,500	46,530	
Reactivations:				
Donna Refinery Partners, Ltd.	Donna, Texas	4,750	0	
GAMXX Energy Inc.	Theodore, Alabama	27,000	10,000	
Petro Source Resources, Inc.	Vicksburg, Mississippi	6,000	7,900	
Trans America Refining Co.	Good Hope, Louisiana	300,000	520,000	
Total		337,750	537,900	
Reclassification:				
Paramount Petroleum Corp.	Bakersfield, California	20,500	34,800	

(Sold to Texaco Refining and Marketing Inc. and merged with Texaco's Bakersfield refinery.)

Source: Energy Information Administration, Form EIA-820, *Annual Refinery Report*.

While average operable distillation capacity increased 1.2 percent in 1987 (Table FE10), gross inputs to crude distillation units increased by 177,000 barrels per day, or 1.4 percent from the 1986 level. As a result, refinery utilization grew to slightly more than 83 percent in 1987.

Refinery utilization declined steadily between 1977 and 1981. Capacity additions exceeded growth in inputs from 1977 until 1979; then inputs declined while capacity continued to grow (Figure FE5). Operable capacity began to decline in 1981; this was 2 years after inputs began to fall off. By 1982, average operable capacity was declining more rapidly than gross inputs, and the utilization rate began to increase. In 1984, as gross inputs increased for the first time since 1978 and operable capacity continued to decline, the utilization rate increased to 76.2 percent.

In 1986, the utilization rate grew to 82.9 percent, as capacity levels stabilized and gross inputs continued to increase. During 1987, as both operable capacity and gross inputs increased slightly, the utilization rate remained at about 83 percent. Therefore, the 1987 utilization rate still indicated an unused capacity of approximately 17 percent (Figure FE5). This compares with an unused capacity range of 6-16 percent during the 1970's when refinery utilization rates ranged between 84 and 94 percent.

Most refineries are designed for greatest efficiency and profitability when operating at utilization rates between 85 and 90 percent. An examination of refinery utilization rates by Petroleum Administration for Defense (PAD) District shows the highest utilization level in the past 7 years occurred in the Midwest (PAD District II). This region's utilization rate was nearly 87 percent in 1987, almost four percentage points above the national average for the year (Table FE10). During the same 7-year period, the Rocky Mountains (PAD District IV) experienced the lowest utilization rate for a particular year -- 64.7 percent in 1981.

Table FE10. Refinery Inputs, Capacity, and Utilization of Crude Distillation Units, by PAD District, 1981-1987

(Thousand Barrels per Day, Except Where Noted)

	PAD District I	PAD District II	PAD District III	PAD District IV	PAD District V	United States
Gross Inputs						
1981	1,363	3,048	5,693	430	2,217	12,751
1982	1,231	2,864	5,586	422	2,069	12,172
1983	1,068	2,806	5,513	427	2,134	11,947
1984	1,130	2,792	5,637	438	2,219	12,216
1985	1,159	2,743	5,555	433	2,275	12,165
1986	1,229	2,833	5,932	434	2,399	12,826
1987	1,256	2,854	5,923	437	2,534	13,003
Average Operable Capacity [1]						
1981	1,943	4,242	8,537	665	3,217	18,604
1982	1,790	3,799	8,084	615	3,147	17,434
1983	1,647	3,562	7,785	560	3,116	16,669
1984	1,579	3,486	7,325	560	3,083	16,033
1985	1,538	3,367	7,199	558	3,010	15,671
1986	1,456	3,296	7,106	534	3,065	15,459
1987	1,450	3,282	7,174	535	3,202	15,642
Utilization Rate (percent) [2]						
1981	70.2	71.9	66.7	64.7	68.9	68.5
1982	68.8	75.4	69.1	68.6	65.8	69.8
1983	64.9	78.8	70.8	76.3	68.5	71.7
1984	71.6	80.1	77.0	78.2	72.0	76.2
1985	75.4	81.5	77.2	77.6	75.6	77.6
1986	84.3	85.9	83.5	81.0	78.2	82.9
1987	86.6	86.9	82.5	81.7	79.1	83.1

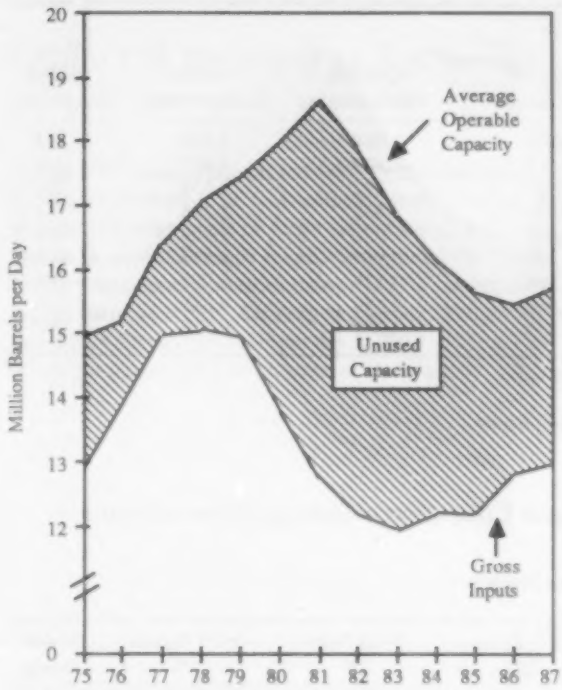
[1] Average of reported monthly operable crude oil distillation capacities.

[2] Utilization rate is expressed as percent and represents gross inputs divided by operable capacity as defined in footnote 1.

Note: Totals may not add to sum of components due to independent rounding.

Source: Energy Information Administration, *Petroleum Supply Annual*, DOE/EIA-0340, Volume 2, Table 13 (1981-1982); Volume 2, Table 11 (1983-1984); Volume 1, Table 11 (1985-1987).

Figure FE5. Inputs and Average Operable Capacity, 1975-1987 [1]



[1] 1975-1980, average of January 1 operable crude oil capacities for the indicated year and the following year; 1981 forward, average of reported monthly operable capacities.

Source: For 1975 through 1986, Energy Information Administration, *Annual Energy Review*, 1986, Table 53. For 1987, *Petroleum Supply Annual*, 1987.

Downstream Capacity

According to responses to EIA's 1988 annual refinery survey, charge capacities of downstream processes showed moderate increases during 1987. Once again, these increases are due primarily to the reactivation of Trans America Refining Company's Good Hope, Louisiana refinery which contributed 520,000 barrels per stream day of the total increase (701,000 barrels per stream day) in downstream charge capacity. Growth in refinery downstream charge capacity during 1987 was greatest for thermal cracking, one of several gasoline-producing processes (Table FE11). Capacity for thermal cracking was 2.1 million barrels per stream day as of January 1, 1988, almost 152,000 barrels per day higher than a year earlier. The reactivated Good Hope, Louisiana refinery accounted for 140,000 barrels of this increase.

The combined charge capacities of gasoline-producing downstream units (thermal crackers, catalytic crackers, and catalytic hydrocrackers) grew 254,200 barrels per stream day, or nearly 3 percent, between January 1, 1987, and January 1, 1988. The reactivated Good Hope refinery was almost solely responsible for this increase with 250,000 barrels per stream day for the three processes combined. The charge capacity for catalytic reforming, a process for raising the octane level of feedstocks suitable for blending into finished gasoline, also increased by over 2 percent between January 1, 1987, and January 1, 1988. However, at 3.9 million barrels per stream day, catalytic reforming capacity was still 5 percent below its peak 1981 level.

During 1987, the EIA began using Form EIA-810, "Monthly Refinery Report," to collect data on fresh feed inputs to coking (delayed and fluid), catalytic cracking, and catalytic hydrocracking units. These processes are all associated with producing motor gasoline. Fluid and delayed coking are both thermal cracking processes which convert heavy, low-grade oils into lighter oils. Catalytic crackers convert gas oils to high-octane gasoline, while catalytic hydrocrackers convert residual material to high-octane gasoline or high-grade fuel oil.

The average total U.S. coking charge capacity during 1987 was 1.5 million barrels per stream day (Table FE12). During 1987, inputs to cokers averaged about 1.3 million barrels per day for a utilization rate of approximately 85 percent. The average total U.S. catalytic cracking charge capacity during 1987, was about 5.3 million barrels per stream day. Inputs to catalytic cracking units during 1987 averaged nearly 4.4 million barrels per day, representing an 82-percent utilization rate. The average total U.S. catalytic hydrocracking charge capacity was 1.2 million barrels per stream day during 1987. Catalytic hydrocracking inputs during 1987 were about 946,000 barrels per day for a utilization rate of 79 percent.

The West Coast area (PAD District V) experienced the highest 1987 average utilization rate (86.2 percent) for coking, catalytic cracking, and catalytic hydrocracking, combined. The Midwest area (PAD District II) had the next highest average utilization rate at 81.3 percent, followed by the Gulf Coast (PAD District III) and the East Coast (PAD District I), both with 81.1 percent. The Rocky Mountain area (PAD District IV) had the lowest utilization rate (74.2 percent) for these three processes combined.

Processes associated with producing lighter products, such as gasoline, increased in production capacity between January 1, 1987 and January 1, 1988. In particular, production capacity of isomers was 465 thousand barrels per stream day on January 1, 1988, nearly 43 percent above the level a year earlier. In addition, production capacity of alkylates was 993 thousand barrels per stream day on January 1, 1988, 2.0 percent above the previous year's level. Concurrently, production capacity of lubricants was down by 7.2 percent from the January 1, 1987, level.

Table FE11. Operable Capacity of Petroleum Refineries by Downstream Process, 1980-1988

(Thousand Barrels per Stream Day)

As of January 1 of Year	Vacuum Distillation	Thermal Cracking	Catalytic Cracking--Fresh & Recycled	Catalytic Reforming	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting
1980	6,381	1,564	5,754	3,970	864	4,616	NA
1981	7,033	1,587	6,136	4,098	909	8,487	NA
1982	7,197	1,782	6,036	3,966	892	8,539	NA
1983	7,180	1,715	5,890	3,918	883	8,354	NA
1984	7,165	1,852	5,802	3,907	952	9,009	NA
1985	6,998	1,858	5,738	3,750	1,053	8,897	NA
1986	6,892	1,880	5,677	3,744	1,125	8,791	NA
1987[1]	6,935	1,928	5,716	3,805	1,189	9,083	230
1988	7,198	2,080	5,806	3,891	1,202	9,170	240

[1] Beginning in 1987, the Hawaiian Independent Refinery is included in U.S. totals.

NA = Not Available.

Source: Energy Information Administration, Form EIA-820, *Annual Refinery Report*.

Table FE12. Refinery Inputs, Charge Capacity, and Utilization of Selected Downstream Units, by PAD District, 1987

(Thousand Barrels per Day, Except Where Noted)

	PAD District I	PAD District II	PAD District III	PAD District IV	PAD District V	United States
Fresh Feed Inputs						
Cokers	63	233	509	16	444	1,265
Catalytic Crackers	503	999	2,075	145	648	4,370
Catalytic Hydrocrackers	51	112	385	6	393	946
Average Capacity[1]						
Cokers	80	287	593	25	504	1,490
Catalytic Crackers	606	1,206	2,580	192	753	5,337
Catalytic Hydrocrackers	74	160	489	7	466	1,196
Utilization Rate (percent)[2]						
Cokers	78.4	81.2	85.9	63.0	88.0	84.9
Catalytic Crackers	83.1	82.8	80.4	75.4	86.1	81.9
Catalytic Hydrocrackers	68.3	69.8	78.8	80.3	84.4	79.1

[1] Average capacity for 1987 is calculated as the sum of January 1, 1987 capacity and January 1, 1988 capacity divided by 2.

[2] Utilization rate is expressed as a percentage and represents inputs divided by capacity as defined in footnote 1.

Note: Totals may not add to sum of components due to independent rounding.

Source: Energy Information Administration, *Petroleum Supply Annual*, DOE/EIA-0340, Volume 1, Refinery Capacity Section, Table 31(capacities: 1987 and 1988); Volume 1, Table 11 (Fresh Feed Inputs: 1987).

Refinery Yield

Refinery yield is based on the ratio of finished products to inputs of crude oil and net inputs of unfinished oils. The annual refinery yield of motor gasoline remained relatively steady throughout the 1980's. In 1987, the refinery yield of motor gasoline was 46.4 percent compared with 44.5 percent in 1980 and 45.6 percent in 1986. The highest annual yield during the 1980's was 47.4 percent in 1983.

The annual refinery yield of distillate fuel oil also remained steady during the 1980's. The distillate yield in 1987 was 20.5 percent, compared with 21.2 percent in 1986.

Refinery yield of residual fuel dropped substantially in the early 1980's, from 11.7 percent in 1980 to 7.1 percent in 1983 through 1985. In 1987, refinery yield of residual fuel oil continued to decline to a level of 6.6 percent. In 1983 jet fuel replaced residual fuel as one of the top three petroleum products (along with motor gasoline and distillate fuel)

produced at refineries. Jet fuel yields were 10.0 percent in 1987 compared with 9.8 percent in 1986.

Crude Oil Receipts at Refineries

During 1987, total crude oil receipts at refineries rose 1.1 percent to an average of 13.1 million barrels per day, as receipts of foreign crude oil more than offset a 3.8-percent decline in domestic crude oil receipts from 1986 levels. Refinery receipts of domestic crude oil in 1987 averaged 8.4 million barrels per day. Refinery receipts of foreign crude rose from 4.2 million barrels per day in 1986 to 4.7 million barrels per day in 1987, an increase of 11.3 percent. This is the second consecutive year during which foreign crude receipts have increased and domestic receipts have decreased from the previous year. However, domestic receipts still comprise about two-thirds of the total crude received at refineries: about 64 percent of the total in 1987 as compared to 67 percent during 1986.

The highest rate of increase in foreign crude receipts regionally during 1987 was 15.7 percent in the Gulf Coast area (PAD District III). Receipts of foreign crude at Gulf Coast refineries increased by nearly 337,000 barrels per day. East Coast (PAD District I) refineries experienced a 10.3-percent increase in foreign crude receipts. Domestic crude receipts during 1987 increased in the West Coast area (PAD District V) by 2.0 percent and in the Rocky Mountains (PAD District IV) by 0.4 percent.

Table 29. Number and Capacity of Operable Petroleum Refineries by PAD District and State as of January 1, 1988

District and State	Number of Operable Refineries			Atmospheric Crude Oil Distillation Capacity					
				Barrels per Calendar Day			Barrels per Stream Day		
	Total	Operating	Idle [1]	Total	Operating	Idle	Total	Operating	Idle
PAD District I	**25**	**22**	**3**	**1,477,113**	**1,422,113**	**55,000**	**1,554,450**	**1,493,450**	**61,000**
Delaware	1	1	0	140,000	140,000	0	150,000	150,000	0
Florida	1	0	1	17,000	0	17,000	20,000	0	20,000
Georgia	2	1	1	33,655	5,655	28,000	35,000	6,000	29,000
New Jersey	6	6	0	434,400	434,400	0	456,400	456,400	0
New York	1	1	0	41,850	41,850	0	45,000	45,000	0
North Carolina	2	1	1	13,000	3,000	10,000	15,500	3,500	12,000
Pennsylvania	8	8	0	727,000	727,000	0	759,500	759,500	0
Virginia	2	2	0	53,400	53,400	0	55,550	55,550	0
West Virginia	2	2	0	16,808	16,808	0	17,500	17,500	0
PAD District II	**41**	**37**	**4**	**3,281,143**	**3,174,143**	**107,000**	**3,435,403**	**3,320,403**	**115,000**
Illinois	7	7	0	929,700	854,700	75,000	978,600	898,600	80,000
Indiana	5	4	1	423,900	422,900	1,000	439,100	437,100	2,000
Kansas	8	6	2	352,800	322,400	30,400	371,483	339,483	32,000
Kentucky	3	2	1	219,500	218,900	600	227,300	226,300	1,000
Michigan	3	3	0	113,500	113,500	0	120,000	120,000	0
Minnesota	2	2	0	222,143	222,143	0	234,220	234,220	0
North Dakota	1	1	0	58,000	58,000	0	60,000	60,000	0
Ohio	4	4	0	488,100	488,100	0	507,000	507,000	0
Oklahoma	6	6	0	381,500	381,500	0	398,700	398,700	0
Tennessee	1	1	0	60,000	60,000	0	65,000	65,000	0
Wisconsin	1	1	0	32,000	32,000	0	34,000	34,000	0
PAD District III	**78**	**71**	**7**	**7,443,207**	**6,841,107**	**602,100**	**7,914,982**	**7,245,107**	**669,875**
Alabama	6	6	0	180,600	180,600	0	187,300	187,300	0
Arkansas	3	3	0	58,400	51,400	7,000	61,000	53,000	8,000
Louisiana	23	20	3	2,621,207	2,262,207	359,000	2,773,775	2,358,900	414,875
Mississippi	6	6	0	368,400	368,400	0	390,900	390,900	0
New Mexico	4	4	0	75,600	75,600	0	84,607	84,607	0
Texas	36	32	4	4,139,000	3,902,900	236,100	4,417,400	4,170,400	247,000
PAD District IV	**19**	**17**	**2**	**539,755**	**526,005**	**13,750**	**559,700**	**545,300**	**14,400**
Colorado	2	2	0	76,500	76,500	0	80,000	80,000	0
Montana	5	4	1	143,850	130,450	13,400	149,000	135,000	14,000
Utah	6	6	0	154,500	154,500	0	160,000	160,000	0
Wyoming	6	5	1	164,905	164,555	350	170,700	170,300	400
PAD District V	**50**	**48**	**2**	**3,174,200**	**3,054,600**	**119,600**	**3,360,023**	**3,227,223**	**132,800**
Alaska	6	6	0	222,700	222,700	0	238,260	238,260	0
California	33	31	2	2,379,200	2,259,600	119,600	2,528,309	2,395,509	132,800
Hawaii	2	2	0	115,900	115,900	0	118,000	118,000	0
Nevada	1	1	0	4,500	4,500	0	4,700	4,700	0
Oregon	1	1	0	0	0	0	0	0	0
Washington	7	7	0	451,900	451,900	0	470,754	470,754	0
U.S. Total	**213**	**195**	**18**	**15,915,418**	**15,017,968**	**897,450**	**16,824,558**	**15,831,483**	**993,075**
Puerto Rico	3	3	0	121,000	121,000	0	128,000	128,000	0
Virgin Islands	1	1	0	545,000	470,000	75,000	595,000	510,000	85,000
Guam	1	0	1	43,900	0	43,900	47,100	0	47,100

See footnotes at end of table.

Table 29. **Number and Capacity of Operable Petroleum Refineries by PAD District and State as of January 1, 1988 (Continued)**

District and State	Downstream Charge Capacity (Barrels per Stream Day)							
	Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting
			Fresh	Recycled				
PAD District I	**735,465**	**81,000**	**602,300**	**56,300**	**354,440**	**74,440**	**897,673**	**16,000**
Delaware	95,000	46,000	65,000	5,000	58,000	19,000	110,000	0
Florida	11,390	0	0	0	0	0	0	0
Georgia	0	0	0	0	0	0	3,153	0
New Jersey	244,100	21,500	251,000	37,000	77,500	0	284,500	0
New York	27,000	0	0	0	0	0	0	0
North Carolina	0	0	0	0	0	0	0	0
Pennsylvania	319,300	0	259,300	12,300	207,690	51,000	475,020	16,000
Virginia	29,000	13,500	27,000	2,000	9,500	0	25,000	0
West Virginia	9,675	0	0	0	3,750	4,440	0	0
PAD District II	**1,273,450**	**371,000**	**1,226,400**	**63,300**	**907,300**	**161,690**	**1,829,800**	**40,400**
Illinois	337,600	120,700	339,000	7,400	280,300	66,500	548,100	0
Indiana	204,200	27,500	166,000	6,000	94,500	0	232,800	5,000
Kansas	119,650	53,000	124,500	10,000	99,300	3,190	188,300	5,500
Kentucky	92,000	57,600	100,000	0	53,500	0	170,300	10,000
Michigan	38,500	0	45,200	1,000	36,500	0	55,300	0
Minnesota	137,000	54,000	78,000	1,000	61,500	0	209,700	0
North Dakota	0	0	26,000	5,200	12,100	0	17,000	0
Ohio	185,000	31,200	177,000	25,300	161,600	87,000	190,000	9,000
Oklahoma	129,000	27,000	131,000	6,400	90,000	5,000	170,000	10,900
Tennessee	10,000	0	30,000	0	10,000	0	33,500	0
Wisconsin	20,500	0	9,700	1,000	8,000	0	14,800	0
PAD District III	**3,362,550**	**1,023,900**	**2,643,900**	**186,875**	**1,810,700**	**493,000**	**4,611,650**	**194,800**
Alabama	50,000	12,000	0	0	32,000	0	63,300	0
Arkansas	23,300	0	18,500	775	9,000	0	18,500	5,500
Louisiana	1,157,700	563,500	923,800	35,800	520,500	149,000	1,164,400	5,000
Mississippi	273,950	70,500	72,000	9,000	95,800	68,000	253,800	0
New Mexico	13,900	0	27,100	6,100	19,200	0	29,200	0
Texas	1,843,700	377,900	1,602,500	135,200	1,134,200	276,000	3,082,450	94,300
PAD District IV	**196,630**	**27,400**	**192,400**	**30,400**	**116,100**	**6,900**	**236,950**	**9,000**
Colorado	23,000	0	23,500	1,000	17,500	0	27,500	0
Montana	53,250	9,900	52,100	6,600	37,800	4,900	121,400	4,000
Utah	45,380	8,500	54,800	10,600	28,550	2,000	39,250	5,000
Wyoming	75,000	9,000	62,000	12,200	32,250	0	48,800	0
PAD District V	**1,630,150**	**577,000**	**759,150**	**44,550**	**702,750**	**466,000**	**1,593,730**	**70,000**
Alaska	6,000	0	0	0	12,000	9,000	0	0
California	1,329,150	496,000	637,150	22,050	558,950	389,100	1,387,430	50,000
Hawaii	58,000	13,000	22,000	3,000	12,000	15,900	15,500	0
Nevada	2,500	0	0	0	0	0	0	0
Oregon	16,000	0	0	0	0	0	0	0
Washington	218,500	68,000	100,000	19,500	119,800	52,000	190,800	20,000
U.S. Total	**7,198,245**	**2,080,300**	**5,424,150**	**381,425**	**3,891,290**	**1,202,030**	**9,169,803**	**240,200**
Puerto Rico	65,000	0	13,500	0	54,500	15,000	77,800	0
Virgin Islands	215,000	85,000	0	0	115,000	0	420,000	0
Guam	1,400	0	0	0	0	0	0	0

[1] Refineries where distillation units are completely idle but not permanently shutdown on January 1, 1988.

Source: Form EIA-820, "Annual Refinery Report."

Table 30. Production Capacity of Operable Petroleum Refineries by PAD District and State as of January 1, 1988
(Barrels per Stream Day, Except Where Noted)

District and State	Production Capacity							
	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/ day)
PAD District I	**76,500**	**174,437**	**19,170**	**36,950**	**33,271**	**115**	**21,050**	**4,455**
Delaware	8,000	0	3,370	0	0	40	10,900	350
Florida	0	9,860	0	0	0	0	0	0
Georgia	0	23,727	0	0	0	0	0	0
New Jersey	23,000	94,850	3,500	25,000	8,500	16	5,050	3,592
New York	0	13,000	0	0	0	0	0	0
Pennsylvania	45,500	33,000	12,300	11,950	20,200	58	0	440
Virginia	0	0	0	0	0	0	5,100	73
West Virginia	0	0	0	0	4,571	1	0	0
PAD District II	**258,000**	**230,850**	**55,364**	**145,368**	**37,325**	**181**	**75,376**	**3,356**
Illinois	86,600	36,350	7,300	11,875	5,800	67	30,875	1,424
Indiana	34,200	48,000	13,000	23,200	6,400	0	7,750	561
Kansas	36,300	7,500	10,169	40,000	2,500	0	10,300	263
Kentucky	12,000	30,000	5,400	12,000	7,900	20	0	200
Michigan	8,200	13,000	0	1,100	0	0	0	95
Minnesota	14,000	49,000	0	23,300	0	20	15,000	459
North Dakota	3,400	0	0	4,000	0	0	0	17
Ohio	25,800	14,500	17,495	10,693	5,000	65	6,390	238
Oklahoma	33,600	19,000	2,000	19,200	9,725	9	5,061	40
Tennessee	2,500	0	0	0	0	0	0	45
Wisconsin	1,400	13,500	0	0	0	0	0	14
PAD District III	**484,900**	**206,923**	**210,205**	**248,590**	**133,225**	**1,077**	**148,506**	**11,257**
Alabama	0	18,003	4,000	7,000	0	16	2,000	150
Arkansas	4,400	10,750	0	5,000	3,235	4	0	21
Louisiana	189,600	67,410	34,600	104,500	37,690	163	67,371	3,089
Mississippi	20,700	40,635	5,500	0	5,000	217	17,750	1,260
New Mexico	3,200	4,100	0	4,000	0	0	0	0
Texas	267,000	66,025	166,105	128,090	87,300	677	61,385	6,737
PAD District IV	**34,430**	**50,850**	**0**	**12,900**	**1,600**	**19**	**7,175**	**119**
Colorado	1,200	4,000	0	0	0	0	0	27
Montana	12,180	26,700	0	4,650	0	19	2,175	37
Utah	11,400	3,200	0	4,750	0	0	1,750	13
Wyoming	9,650	16,950	0	3,500	1,600	0	3,250	42
PAD District V	**139,210**	**124,958**	**3,820**	**21,460**	**26,800**	**1,026**	**116,201**	**8,452**
Alaska	0	8,475	2,320	4,000	0	13	0	15
California	111,310	87,683	1,500	13,210	26,800	910	99,801	8,183
Hawaii	4,500	1,300	0	1,500	0	23	0	0
Oregon	0	11,500	0	0	0	0	0	0
Washington	23,400	16,000	0	2,750	0	80	16,400	254
U.S. Total	**993,040**	**788,018**	**288,559**	**465,268**	**232,221**	**2,418**	**368,308**	**27,639**
Puerto Rico	0	1,000	15,000	0	9,000	18	0	80
Virgin Islands	0	0	35,000	18,000	0	0	0	580
Guam	0	350	0	0	0	0	0	0

MMcfd = Million cubic feet per day.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988
(Barrels per Stream Day, Except Where Noted)

Refiner	Refineries on Page(s)
Amber Refining Inc.	88
Amerada Hess Corp.	82, 84, 96
Amoco Oil Co.	76, 78, 86, 88, 92, 94
Arco Alaska Inc.	72
Arco Petroleum Products Co.	72, 94
Ashland Oil Inc.	80, 82, 86
Atlantic Refining & Marketing Corp.	88
Augusta Refining Co.	78
Barrett Refining Corp.	86
Belcher Oil Co.	72
Berry Petroleum Co.	72
Big West Oil Co.	92
Bloomfield Refining Co.	84
BP Oil Corp.	88
Calcasieu Refining Co.	80
Calumet Refining Co.	80
Canal Refining Co.	80
Caribbean Gulf Refining Corp.	96
Cenex	84
Champlin Refining Co.	88
Chevron U.S.A. Inc.	72, 76, 82, 84, 88, 90, 92, 94
Cibro Petroleum Products Inc.	86
Citgo Petroleum Corp.	80
City Gas & Transmission Corp.	86
Claiborne Gasoline Co.	80
Clark Oil & Refining Corp.	78
Coastal Eagle Point Oil Co.	84
Coastal Refining & Marketing Inc.	90
Colorado Refining Co.	76
Conoco Inc.	74, 76, 80, 84, 86
Cross Oil & Refining Co. of Arkansas	72
Crown Central Petroleum Corp.	90
Crysen Refining Inc.	92
Crystal Refining Co.	82
Derby Refining Co.	78
Diamond Shamrock Refining & Marketing Co.	90
Donna Refinery Partners Ltd.	90
Edgington Oil Co. Inc.	74
El Paso Refining Co. Ltd.	90
Ergon Inc.	84
Exxon Co. U.S.A.	74, 80, 84, 90
Farmland Industries Inc.	78
Fina Oil & Chemical Co.	90
Fletcher Oil & Refining Co.	74
Flying J Petroleum Inc.	84
Frontier Refining Co.	96
GAMXX Energy Inc.	72
Giant Refining Co.	86
Gibson Oil & Refining Co. Inc.	74
GNC Energy Corp.	86
Golden West Refining Co.	74
Guam Oil & Refining Co. Inc.	96
Hawaiian Independent Refinery Inc.	76
Hill Petroleum Co.	80, 90
Howell Hydrocarbons Corp.	90
Hunt Oil Co.	72
Huntway Refining Co.	74
Indiana Farm Bureau Cooperative Association	78
Kentucky Oil & Refining Co.	78, 80
Kern Oil & Refining Co.	74
Kerr-McGee Refining Corp.	80, 86
Koch Refining Co.	82, 90
La Gloria Oil & Gas Co.	90
Laketon Refining Corp.	78
Leal Petroleum Corp.	90
Lion Oil Co.	72
Liquid Energy Corp.	90
Little America Refining Co.	96
LL&E Petroleum Marketing	72
Lunday Thagard Co.	74
Lyondell Petrochemical Co.	90
MacMillan Petroleum Co.	74
Mapco Petroleum Inc.	72, 88
Marathon Petroleum Co.	78, 80, 82, 92
Mid Atlantic Fuels Inc.	94
Mobil Oil Corp.	74, 76, 84, 92, 94
Montana Refining Co.	84
Moto- Oils Refining Co.	78
Mountaineer Refining Co. Inc.	96
Murphy Oil U.S.A. Inc.	80, 94
National Cooperative Refinery Association	78
Navajo Refining Co.	86
Nevada Refining Co.	84
Newhall Refining Co. Inc.	74
OGC Corp.	80
Oxnard Refinery	74
Pacific Refining Co. Inc.	74
Paramount Petroleum Corp.	74
Pennzoil Products Co.	80, 88, 94
Petro Source Resources Inc.	84
Petro Star	72
Petrolite Corp.	92
Phillips Puerto Rico Core Inc.	96
Phillips 66 Co.	92, 94
Placid Refining Co.	80
Powerine Oil Co.	74
Pride Refining Inc.	92
Primary Oil & Energy Corp.	94
Quaker State Oil Refining Corp.	88, 94
Rock Island Refining Corp.	78
San Joaquin Refining Co. Inc.	74
Seaview Petroleum Inc.	84
Seminole Refining Corp.	76
Shell Oil Co.	74, 78, 82, 92, 94
Sinclair Oil Corp.	86, 96
Somerset Refinery Inc.	80
Sound Refining Inc.	94
South Hampton Refining Co.	92
Southland Oil Co.	84
Southwestern Refining Co. Inc.	92
Standard Oil Co.	82, 86
Sun Co Inc.	86, 88, 96
Sunland Refining Corp.	74
Tenneco Oil Co.	82
Tesoro Petroleum Corp.	72
Texaco Refining & Marketing Inc.	74, 76, 78, 82, 92, 94
Texas City Refining Inc.	92
Texas NAPCO Inc.	82
Thriftway Co.	86
Tosco Corp.	76
Total Petroleum Inc.	78, 82, 86
Trans America Refining Co.	82
Trifinery	92
U.S. Oil & Refining Co.	94
Union Pacific Resources Co.	76
United Refining Co.	88
Unocal Corp.	76, 78, 92
Valero Refining Co.	92
Vulcan Refining Co.	72
Warrior Asphalt Refining Corp.	72
West Coast Oil Co.	76
Witco Corp.	76, 88
Wyoming Refining Co.	96
Young Refining Corp.	76

best copy available

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Alabama	**180,600**	**0**	**187,300**	**0**	**50,000**	**12,000**	**0**	**0**	**32,000**
Belcher Oil Co.									
Chickasaw	26,600	0	28,000	0	10,000	0	0	0	0
GAMXX Energy Inc. (Formerly Marion Corp.)									
Theodore	27,000	0	28,000	0	0	0	0	0	[1] 5,000
Hunt Oil Co.									
Tuscaloosa	33,500	0	35,000	0	15,000	[3] 12,000	0	0	[4] 6,000
LL&E Petroleum Marketing									
Saraland	80,000	0	81,300	0	20,000	0	0	0	[1] 21,000
Vulcan Refining Co.									
Cordova	9,500	0	10,000	0	5,000	0	0	0	0
Warrior Asphalt Refining Corp.									
Holt	4,000	0	5,000	0	0	0	0	0	0
Alaska	**222,700**	**0**	**238,260**	**0**	**6,000**	**0**	**0**	**0**	**12,000**
Arco Alaska Inc.									
Anchorage	12,000	0	13,000	0	0	0	0	0	0
Prudhoe Bay	20,000	0	24,000	0	0	0	0	0	0
Chevron U.S.A. Inc.									
Kenai	22,000	0	22,500	0	0	0	0	0	0
Mapco Petroleum Inc.									
North Pole	90,000	0	91,760	0	6,000	0	0	0	0
Petro Star									
North Pole	6,700	0	7,000	0	0	0	0	0	0
Tesoro Petroleum Corp.									
Kenai	72,000	0	80,000	0	0	0	0	0	[4] 12,000
Arkansas	**51,400**	**7,000**	**53,000**	**8,000**	**23,300**	**0**	**18,500**	**775**	**9,000**
Berry Petroleum Co.									
Stephens	3,700	0	4,000	0	1,500	0	0	0	0
Cross Oil & Refining Co. of Arkansas									
Smackover	6,700	0	7,000	0	3,300	0	0	0	0
Lion Oil Co.									
El Dorado	41,000	7,000	42,000	8,000	18,500	0	18,500	775	[4] 9,000
California	**2,259,600**	**119,600**	**2,395,509**	**132,800**	**1,329,150**	**496,000**	**637,150**	**22,050**	**558,950**
Arco Petroleum Products Co.									
Carson	214,000	0	225,000	0	112,000	[3] 56,000	77,000	0	[1] 48,000
Chevron U.S.A. Inc.									
El Segundo	390,000	15,000	435,000	18,000	179,000	[3] 54,000	60,000	0	[4] 25,000 [1] 35,000
Richmond	270,000	80,000	280,000	85,000	175,000	0	63,000	0	[4] 50,000 [1] 18,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Alabama	**0**	**63,300**	**0**	**0**	**18,003**	**4,000**	**7,000**	**0**	**16**	**2,000**	**150**
Chickasaw	0	0	0	0	6,000	0	0	0	0	0	0
Theodore	0	[2] 5,000	0	0	0	4,000	0	0	0	0	10
Tuscaloosa	0	[5] 9,800 [2] 7,500 [6] 5,000	0	0	9,500	0	0	0	6	2,000	80
Saraland	0	[5] 15,000 [2] 21,000	0	0	0	0	[7] 1,000 [8] 6,000	0	10	0	60
Cordova	0	0	0	0	2,500	0	0	0	0	0	0
Holt	0	0	0	0	3	0	0	0	0	0	0
Alaska	**9,000**	**0**	**0**	**0**	**8,475**	**2,320**	**4,000**	**0**	**13**	**0**	**15**
Anchorage	0	0	0	0	0	0	0	0	0	0	0
Prudhoe Bay	0	0	0	0	0	0	0	0	0	0	0
Kenai	0	0	0	0	6,000	0	0	0	0	0	0
North Pole	0	0	0	0	2,475	2,320	0	0	0	0	0
North Pole	0	0	0	0	0	0	0	0	0	0	0
Kenai	9,000	0	0	0	0	0	[8] 4,000	0	13	0	15
Arkansas	**0**	**18,500**	**5,500**	**4,400**	**10,750**	**0**	**5,000**	**3,235**	**4**	**0**	**21**
Stephens	0	0	0	0	1,000	0	0	0	0	0	0
Smackover	0	[9] 3,000	0	0	2,050	0	0	3,235	4	0	0
El Dorado	0	[2] 10,000 [6] 5,500	5,500	4,400	7,700	0	[8] 5,000	0	0	0	21
California	**389,100**	**1,387,430**	**50,000**	**111,310**	**87,683**	**1,500**	**13,210**	**26,800**	**910**	**99,801**	**8,183**
Carson	22,000	[5] 70,000 [2] 40,000 [6] 18,000 [9] 18,000	0	9,000	0	0	0	0	70	12,500	180
El Segundo	45,000	[5] 60,000 [2] 56,000 [6] 14,000 [9] 42,000	0	8,000	0	1,500	0	0	112	14,500	840
Richmond	105,500	[5] 60,000 [2] 63,000 [6] 65,000 [9] 18,200	50,000	9,200	11,000	0	0	11,800	135	0	672

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil

E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
California (Continued)									
Conoco Inc.									
Santa Maria	9,500	0	10,000	0	7,800	0	0	0	0
Edgington Oil Co. Inc.									
Long Beach	41,600	0	44,800	0	21,000	0	0	0	0
Exxon Co. U.S.A.									
Benicia	126,000	0	130,000	0	63,000	[10] 27,500	64,000	11,000	[1] 28,000
Fletcher Oil & Refining Co.									
Carson	29,500	0	31,709	0	0	0	9,450	1,050	[1] 5,000
Gibson Oil & Refining Co. Inc.									
Bakersfield	0	9,600	0	9,800	0	0	0	0	0
Golden West Refining Co.									
Santa Fe Springs	42,000	0	45,000	0	25,000	[11] 13,800	13,500	0	[1] 19,000
Huntway Refining Co.									
Benicia	8,600	0	9,000	0	7,600	0	0	0	0
Wilmington	5,500	0	6,000	0	4,800	0	0	0	0
Kern Oil & Refining Co.									
Bakersfield	21,400	0	23,000	0	0	0	0	0	[1] 3,000
Lunday Thagard Co.									
South Gate	8,100	0	8,500	0	7,000	0	0	0	0
Macmillan Petroleum Co.									
Signal Hill	14,000	0	15,200	0	0	0	0	0	0
Mobil Oil Corp.									
Torrance	123,000	0	130,000	0	95,000	[3] 48,000	63,000	0	[1] 36,000
Newhall Refining Co. Inc.									
Newhall	22,500	0	24,000	0	10,000	0	0	0	[4] 2,500
Oxnard Refinery									
Oxnard	4,000	0	5,000	0	0	0	0	0	0
Pacific Refining Co. Inc.									
Hercules	55,000	0	57,000	0	20,000	[11] 12,000	0	0	[1] 15,000
Paramount Petroleum Corp.									
Paramount	46,500	0	48,000	0	28,000	0	0	0	[1] 11,500
Powerine Oil Co.									
Santa Fe Springs	35,000	0	35,900	0	20,350	[10] 10,400	10,200	0	[4] 8,200
San Joaquin Refining Co. Inc.									
Bakersfield	14,300	10,000	15,000	12,000	10,000	[11] 5,000	0	0	0
Shell Oil Co.									
Carson	112,000	0	115,000	0	70,000	[3] 53,000	42,000	0	[1] 24,000
Martinez	140,100	0	143,000	0	96,500	[10] 22,000	67,000	1,000	[4] 28,000
Sunland Refining Corp.									
Bakersfield	12,000	0	17,000	0	0	0	0	0	[1] 1,250
Texaco Refining & Marketing Inc.									
Bakersfield	41,000	0	42,000	0	22,000	[3] 11,800	0	0	[1] 23,000
Wilmington	57,000	0	60,000	0	42,000	[3] 48,000	28,000	8,000	[1] 35,000

Table 31. **Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)**
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
California (Continued)											
Santa Maria	0	0	0	0	6,800	0	0	0	0	0	0
Long Beach	0	0	0	0	15,000	0	0	0	0	0	0
Benicia	29,500	[5] 37,000 [2] 44,500 [6] 25,000 [9] 17,000	0	14,000	0	0	0	0	104	5,500	304
Carson	0	[5] 10,500	0	0	0	0	0	0	0	0	0
Bakersfield	0	0	0	0	0	0	0	0	0	0	0
Santa Fe Springs	11,000	[2] 12,000	0	3,000	0	0	0	0	11	0	30
Benicia	0	0	0	0	4,500	0	0	0	0	0	0
Wilmington	0	0	0	0	2,750	0	0	0	0	0	0
Bakersfield	0	[2] 3,000	0	0	0	0	0	0	0	0	0
South Gate	0	0	0	0	5,833	0	0	0	0	0	0
Signal Hill	0	0	0	0	0	0	0	0	0	0	0
Torrance	21,700	[2] 37,000 [6] 28,000	0	12,300	0	0	0	0	62	14,500	221
Newhall	0	[5] 5,000 [2] 2,500 [6] 6,500	0	0	4,600	0	0	0	0	0	4,000
Oxnard	0	0	0	0	1,200	0	0	0	0	0	0
Hercules	4,000	[2] 15,000	0	0	0	0	0	0	0	0	0
Paramount	0	[6] 7,000 [9] 21,500	0	0	15,000	0	0	0	0	0	0
Santa Fe Springs	7,600	[5] 11,000 [2] 8,800 [6] 8,300	0	2,310	0	0	[7] 1,810	0	18	2,600	0
Bakersfield	0	0	0	0	6,000	0	0	0	0	0	0
Carson	0	[2] 25,000 [6] 38,000 [9] 47,000	0	8,600	0	0	0	0	36	12,500	300
Martinez	28,000	[5] 50,000 [2] 17,000 [6] 17,000 [9] 37,300	0	8,000	11,000	0	0	4,500	110	635	241
Bakersfield	0	[2] 1,250	0	0	0	0	0	0	0	0	0
Bakersfield	14,300	[5] 15,000 [2] 14,000	0	0	0	0	0	0	21	3,125	18
Wilmington	20,000	[2] 18,000	0	4,400	0	0	0	0	48	8,250	308

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil

E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
California (Continued)									
Tosco Corp.									
Martinez	126,000	0	132,600	0	105,000	[10] 42,000	55,000	1,000	[4] 23,000 [1] 20,000
Union Pacific Resources Co. (Formerly Champlin Petroleum Co.)									
Wilmington	65,000	0	71,000	0	35,000	[3] 24,000	38,000	0	[4] 14,500
Unocal Corp.									
Arroyo Grande	41,000	0	44,000	0	32,000	[3] 24,800	0	0	0
Rodeo	77,000	0	81,800	0	42,100	[3] 23,700	0	0	[4] 16,000 [1] 18,000
Wilmington	108,000	0	111,000	0	89,000	[11] 20,000	47,000	0	[4] 36,000 [1] 16,000
West Coast Oil Co.									
Oildale *	0	5,000	0	8,000	0	0	0	0	0
Witco Corp.									
Oildale	0	0	0	0	10,000	0	0	0	0
Colorado	**76,500**	**0**	**80,000**	**0**	**23,000**	**0**	**23,500**	**1,000**	**17,500**
Colorado Refining Co. (Formerly Asamera Oil(US) Inc.)									
Commerce City	33,500	0	35,000	0	10,000	0	8,500	0	[4] 10,000
Conoco Inc.									
Commerce City	43,000	0	45,000	0	13,000	0	15,000	1,000	[1] 7,500
Delaware	**140,000**	**0**	**150,000**	**0**	**95,000**	**46,000**	**65,000**	**5,000**	**56,000**
Texaco Refining & Marketing Inc.									
Delaware City	140,000	0	150,000	0	95,000	[10] 46,000	65,000	5,000	[4] 38,000 [1] 18,000
Florida	**0**	**17,000**	**0**	**20,000**	**11,390**	**0**	**0**	**0**	**0**
Seminole Refining Corp.									
St. Marks	0	17,000	0	20,000	11,390	0	0	0	0
Georgia	**5,655**	**28,000**	**6,000**	**29,000**	**0**	**0**	**0**	**0**	**0**
Amoco Oil Co.									
Savannah	0	28,000	0	29,000	0	0	0	0	0
Young Refining Corp.									
Douglasville	5,655	0	6,000	0	0	0	0	0	0
Hawaii	**115,900**	**0**	**118,000**	**0**	**58,000**	**13,000**	**22,000**	**3,000**	**12,000**
Chevron U.S.A. Inc.									
Honolulu	48,000	0	50,000	0	28,000	0	22,000	3,000	0
Hawaiian Independent Refinery Inc.									
Ewa Beach	67,900	0	68,000	0	30,000	[11] 13,000	0	0	[4] 12,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
California (Continued)											
Martinez	23,000	[5] 50,000 [2] 13,500 [6] 28,000	0	12,000	0	0	0	0	80	7,500	180
Wilmington	0	[5] 40,000 [2] 15,000	0	10,500	0	0	[7] 4,000	0	0	7,000	120
Arroyo Grande	0	0	0	0	0	0	0	0	0	5,741	153
Rodeo	32,500	[2] 23,000 [6] 9,500 [9] 14,500	0	0	0	0	[8] 7,400	4,500	65	5,450	392
Wilmington	25,000	[2] 54,000 [6] 36,000	0	10,000	0	0	0	0	38	0	224
Oildale *	0	0	0	0	0	0	0	0	0	0	0
Oildale	0	[6] 580	0	0	4,000	0	0	6,000	0	0	0
Colorado	**0**	**27,500**	**0**	**1,200**	**4,000**	**0**	**0**	**0**	**0**	**0**	**27**
Commerce City	0	[2] 10,000	0	1,200	0	0	0	0	0	0	8
Commerce City	0	[2] 7,500 [6] 10,000	0	0	4,000	0	0	0	0	0	19
Delaware	**19,000**	**110,000**	**0**	**8,000**	**0**	**3,370**	**0**	**0**	**40**	**10,900**	**350**
Delaware City	19,000	[2] 55,000 [6] 55,000	0	8,000	0	3,370	0	0	40	10,900	350
Florida	**0**	**0**	**0**	**0**	**9,860**	**0**	**0**	**0**	**0**	**0**	**0**
St Marks	0	0	0	0	9,860	0	0	0	0	0	0
Georgia	**0**	**3,153**	**0**	**0**	**23,727**	**0**	**0**	**0**	**0**	**0**	**0**
Savannah	0	0	0	0	20,880	0	0	0	0	0	0
Douglasville	0	[2] 780 [8] 1,178 [9] 1,195	0	0	2,847	0	0	0	0	0	0
Hawaii	**15,900**	**15,500**	**0**	**4,500**	**1,300**	**0**	**1,500**	**0**	**23**	**0**	**0**
Honolulu	0	[9] 3,500	0	4,500	1,300	0	[7] 1,500	0	3	0	0
Ewa Beach	15,900	[2] 12,000	0	0	0	0	0	0	20	0	0

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum	Thermal	Catalytic Cracking		Catalytic
	Operating	Idle	Operating	Idle	Distillation	Cracking	Fresh	Recycled	Reforming
Illinois	**854,700**	**75,000**	**898,600**	**80,000**	**337,600**	**120,700**	**339,000**	**7,400**	**280,300**
Clark Oil & Refining Corp.									
Blue Island	E 64,600	0	E 68,000	0	E 27,000	0	E 25,000	E 1,000	[1] E 30,500
Hartford	E 63,600	0	E 65,000	0	E 18,000	[3] E 14,500	E 26,000	E 1,000	[1] E 12,000
Marathon Petroleum Co.									
Robinson	120,000	75,000	125,000	80,000	38,000	[11] 4,000 [3] 21,000	38,000	400	[4] 65,000
Mobil Oil Corp.									
Joliet	180,000	0	200,000	0	88,000	[3] 35,000	98,000	0	[1] 46,000
Motor Oils Refining Co.									
McCook	1,500	0	1,600	0	1,200	0	0	0	0
Shell Oil Co.									
Wood River	274,000	0	286,000	0	105,500	[11] 18,000	94,000	0	[4] 75,000 [1] 22,000
Unocal Corp.									
Lemont	151,000	0	153,000	0	59,900	[3] 28,200	58,000	5,000	[1] 29,800
Indiana	**422,900**	**1,000**	**437,100**	**2,000**	**204,200**	**27,500**	**166,000**	**6,000**	**94,500**
Amoco Oil Co.									
Whiting	350,000	0	360,000	0	174,000	[3] 27,500	140,000	4,000	[1] 80,000
Indiana Farm Bureau Cooperative Association									
Mount Vernon	21,200	0	22,600	0	7,200	0	8,000	200	[1] 4,500
Kentucky Oil & Refining Co.									
Troy *	0	E 1,000	0	E 2,000	0	0	0	0	0
Laketon Refining Corp.									
Laketon	8,700	0	9,500	0	6,000	0	0	0	0
Rock Island Refining Corp.									
Indianapolis	43,000	0	45,000	0	17,000	0	18,000	1,800	[4] 10,000
Kansas	**322,400**	**30,400**	**339,483**	**32,000**	**119,650**	**53,000**	**124,500**	**10,000**	**99,300**
Augusta Refining Co.									
Augusta	0	0	0	0	0	0	0	0	[4] 9,000
Derby Refining Co.									
El Dorado	0	30,400	0	32,000	10,000	0	14,000	2,000	[1] 5,700
Wichita	26,800	0	31,300	0	10,000	[3] 5,000	17,000	2,500	[1] 7,000
Farmland Industries Inc.									
Coffeyville	56,500	0	60,723	0	19,500	[3] 13,000	23,000	1,500	[1] 16,000
Phillipsburg	26,400	0	27,460	0	10,000	0	0	0	[1] 5,300
National Cooperative Refinery Association									
McPherson	75,600	0	80,000	0	27,000	[3] 22,000	20,000	500	[1] 15,000
Texaco Refining & Marketing Inc.									
El Dorado	81,500	0	84,000	0	27,000	[3] 13,000	31,500	3,500	[1] 25,000
Total Petroleum Inc.									
Arkansas City	53,600	0	56,000	0	16,150	0	19,000	0	[4] 10,000 [1] 6,300

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Illinois	**66,500**	**548,100**	**0**	**86,600**	**36,350**	**7,300**	**11,875**	**5,800**	**67**	**30,875**	**1,424**
Blue Island	E 11,000	[2] E 20,500	0	E 6,000	E 4,500	0	0	0	0	0	E 28
Hartford	0	[2] E 12,000 [6] E 12,000	0	E 8,000	0	0	[8] E 4,000	0	E 3	E 3,750	E 110
Robinson	22,000	[2] 52,000 [6] 11,000	0	7,600	0	0	[8] 7,875	0	25	6,000	45
Joliet	0	[2] 81,000 [6] 75,000	0	25,000	0	0	0	0	0	11,125	347
McCook	0	0	0	0	150	0	0	1,200	0	0	0
Wood River	33,500	[5] 29,000 [2] 64,000 [6] 52,500 [9] 42,000	0	22,000	28,500	3,800	0	4,600	28	0	504
Lemont	0	[5] 4,300 [2] 53,800 [6] 39,000	0	18,000	3,200	3,500	0	0	11	10,000	390
Indiana	**0**	**232,800**	**5,000**	**34,200**	**48,000**	**13,000**	**23,200**	**6,400**	**0**	**7,750**	**561**
Whiting	0	[5] 80,000 [2] 87,000 [6] 42,000 [9] 4,300	0	26,000	40,000	13,000	[8] 21,000	6,400	0	7,750	540
Mount Vernon	0	[2] 6,000	0	1,700	2,200	0	[8] 2,200	0	0	0	0
Troy *	0	0	0	0	0	0	0	0	0	0	0
Laketon	0	0	0	0	3,800	0	0	0	0	0	0
Indianapolis	0	[2] 13,500	5,000	6,500	2,000	0	0	0	0	0	21
Kansas	**3,190**	**188,300**	**5,500**	**36,300**	**7,500**	**10,169**	**40,000**	**2,500**	**0**	**10,300**	**263**
Augusta	0	[2] 14,000	0	0	0	7,200	[8] 5,500	0	0	0	0
El Dorado	0	[2] 5,500	5,500	3,300	5,500	0	0	0	0	0	0
Wichita	0	[2] 7,000	0	3,000	0	0	0	0	0	1,050	0
Coffeyville	0	[2] 26,500 [6] 5,000	0	6,000	0	0	[8] 8,000	2,500	0	3,000	8
Phillipsburg	0	[2] 7,500	0	0	2,000	0	0	0	0	0	0
McPherson	0	[2] 24,500 [6] 13,000	0	6,000	0	0	[7] 2,000 [8] 9,500	0	0	3,200	46
El Dorado	0	[5] 44,000 [2] 25,000	0	12,500	0	2,969	[8] 15,000	0	0	3,050	196
Arkansas City	3,190	[2] 16,300	0	5,500	0	0	0	0	0	0	13

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Kentucky	**218,900**	**600**	**226,300**	**1,000**	**92,000**	**57,600**	**100,000**	**0**	**53,500**
Ashland Oil Inc.									
Catlettsburg	213,400	0	220,000	0	92,000	[11] 2,600 [12] 55,000	100,000	0	[4] 27,000 [1] 25,500
Kentucky Oil & Refining Co.									
Betsy Lane	0	600	0	1,000	0	0	0	0	0
Somerset Refinery Inc.									
Somerset	5,500	0	6,300	0	0	0	0	0	[1] 1,000
Louisiana	**2,262,207**	**359,000**	**2,358,900**	**414,875**	**1,157,700**	**563,500**	**923,800**	**35,800**	**520,500**
Calcasieu Refining Co.									
Lake Charles	13,500	0	14,000	0	0	0	0	0	0
Calumet Refining Co.									
Princeton	4,207	0	4,400	0	4,400	0	0	0	0
Canal Refining Co.									
Church Point	8,000	0	8,800	0	0	0	0	0	[4] 1,900
Citgo Petroleum Corp.									
Lake Charles	297,000	23,000	305,000	25,000	83,000	[3] 80,000	150,000	0	[4] 71,000 [1] 20,000
Claiborne Gasoline Co.									
Lisbon	7,500	0	7,700	0	0	0	0	0	[4] 2,000
Conoco Inc.									
Egan	2,800	0	3,000	0	0	0	0	0	0
Westlake	156,500	0	164,000	0	63,000	[3] 53,000 [12] 12,000	38,000	0	[4] 11,500 [1] 15,900
Exxon Co. U.S.A.									
Baton Rouge	455,000	0	474,000	0	205,000	[3] 80,000	155,000	0	[4] 60,000 [1] 35,000
Hill Petroleum Co.									
Krotz Springs	56,000	0	60,000	0	15,000	0	27,000	0	[1] 12,500
St.Rose	34,700	0	35,000	0	20,000	0	0	0	0
Kerr-McGee Refining Corp.									
Cotton Valley	7,800	0	8,500	0	0	0	0	0	0
Dubach	10,000	0	11,000	0	0	0	0	0	[4] 2,200
Marathon Petroleum Co.									
Garyville	255,000	0	263,000	0	125,000	0	75,000	14,000	[4] 50,000
Murphy Oil U.S.A. Inc.									
Meraux	78,500	14,000	80,500	14,500	40,000	0	35,300	3,000	[4] 23,000
OGC Corp.									
(Formerly Louisiana Oil Refg. Co. of Egan)									
Egan	0	5,000	0	5,375	0	0	0	0	0
Pennzoil Products Co.									
Shreveport	46,200	0	50,000	0	24,300	0	0	0	[1] 10,000
Placid Refining Co.									
Port Allen	46,000	0	50,000	0	20,000	0	18,500	1,500	[4] 10,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Kentucky	0	170,300	10,000	12,000	30,000	5,400	12,000	7,900	20	0	200
Catlettsburg	0	[5] 40,000 [2] 72,000 [6] 40,000 [9] 17,000	10,000	12,000	30,000	5,400	[8] 12,000	7,900	20	0	200
Betsy Lane	0	0	0	0	0	0	0	0	0	0	0
Somerset	0	[2] 1,300	0	0	0	0	0	0	0	0	0
Louisiana	[r] 9,000	1,154,400	5,000	199,600	67,410	34,600	104,500	37,690	163	67,371	3,089
Lake Charles	0	0	0	0	0	0	0	0	0	0	0
Princeton	0	0	0	0	910	0	0	3,490	0	0	0
Church Point	0	0	0	0	0	0	0	0	0	0	0
Lake Charles	37,000	[2] 91,000 [6] 14,000 [9] 40,000	0	20,200	0	0	0	9,200	0	15,000	342
Lisbon	0	0	0	0	0	0	[8] 2,000	0	0	0	0
Egan	0	0	0	0	0	0	0	0	0	0	0
Westlake	0	[5] 44,000 [2] 33,000 [6] 44,000 [9] 13,500	0	6,000	0	2,100	0	0	0	16,361	290
Baton Rouge	24,000	[2] 97,500 [6] 55,000 [9] 19,000	0	33,200	28,900	0	0	16,500	0	22,400	661
Kraiz Springs	0	[2] 13,000	0	0	0	0	[7] 1,500	0	0	0	10
St.Rose	0	0	0	0	0	0	0	0	0	0	0
Cotton Valley	0	0	0	0	0	0	0	0	0	0	0
Dubach	0	[2] 2,200	0	0	0	0	0	0	0	0	0
Garyville	0	[5] 58,000 [2] 50,000 [6] 35,500	0	20,000	25,100	0	[7] 7,000 [8] 9,000	0	0	0	504
Meraux	0	[2] 29,000 [6] 15,000	0	8,700	12,000	0	0	0	0	0	24
Egan	0	0	0	0	0	0	0	0	0	0	0
Shreveport	0	[5] 5,500 [2] 10,000 [9] 1,200	0	0	600	0	0	8,500	6	0	13
Port Allun	0	[2] 10,000	5,000	4,000	0	0	0	0	0	0	6

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_3 and C_5 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil

E = Estimated. MMcfd = Million cubic feet per day.
[r] Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Louisiana (Continued)									
Shell Oil Co.									
Norco	215,000	0	220,000	0	78,000	[3] 21,000 [12] 103,500	90,000	10,000	[4] 38,000 [1] 18,000
Standard Oil Co.									
Belle Chasse	198,500	0	205,000	0	75,000	[3] 19,000	89,000	2,300	[1] 37,500
Tenneco Oil Co.									
Chalmette	145,000	0	155,000	0	70,000	[3] 33,000	51,000	0	[4] 19,000 [1] 28,000
Texaco Refining & Marketing Inc.									
Convent	225,000	0	240,000	0	75,000	[11] 12,000	85,000	5,000	[1] 40,000
Texas NAPCO Inc.									
St James *	0	17,000	0	20,000	20,000	0	0	0	0
Trans America Refining Co.									
Good Hope	0	300,000	0	350,000	240,000	[11] 140,000	110,000	0	[1] 15,000
Michigan	**113,500**	**0**	**120,000**	**0**	**35,500**	**0**	**45,200**	**1,000**	**36,500**
Crystal Refining Co.									
Carson City	3,000	0	6,000	0	0	0	0	0	0
Marathon Petroleum Co.									
Detroit	68,500	0	70,000	0	38,500	0	26,000	1,000	[4] 14,000 [1] 6,500
Total Petroleum Inc.									
Alma	42,000	0	44,000	0	0	0	19,200	0	[4] 16,000
Minnesota	**222,143**	**0**	**234,220**	**0**	**137,000**	**54,000**	**78,000**	**1,000**	**61,500**
Ashland Oil Inc.									
St. Paul	67,143	0	69,220	0	32,000	0	23,000	0	[1] 23,500
Koch Refining Co.									
St. Paul	155,000	0	165,000	0	105,000	[3] 54,000	55,000	1,000	[4] 26,000 [1] 12,000
Mississippi	**368,400**	**0**	**390,900**	**0**	**273,950**	**70,500**	**72,000**	**9,000**	**95,800**
Amerada Hess Corp.									
Purvis	30,000	0	32,000	0	0	[10] 8,500	16,000	7,000	[1] 5,800
Chevron U.S.A. Inc.									
Pascagoula	295,000	0	310,000	0	243,000	[3] 62,000	56,000	2,000	[4] 57,000 [1] 33,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Louisiana (Continued)											
Norco	35,000	[5] 70,000 [2] 29,000 [9] 28,000	0	15,000	0	0	0	0	70	5,000	113
Belle Chasse	0	[2] 42,000 [6] 46,000	0	35,000	0	22,500	0	0	0	860	56
Chalmette	18,000	[5] 43,000 [2] 45,000 [6] 24,000	0	19,000	0	7,000	0	0	24	7,750	202
Convent	35,000	[2] 40,000 [6] 37,000 [9] 65,000	0	14,500	0	0	0	0	63	0	728
St James *	0	0	0	0	0	0	0	0	0	0	0
Good Hope	0	[2] 15,000	0	14,000	0	3,000	[7] 5,000 [8] 80,000	0	0	0	140
Michigan	**0**	**55,300**	**0**	**8,200**	**13,000**	**0**	**1,100**	**0**	**0**	**0**	**95**
Carson City	0	0	0	0	0	0	0	0	0	0	0
Detroit	0	[5] 12,000 [2] 19,500 [6] 3,000	0	4,000	13,000	0	0	0	0	0	80
Alma	0	[2] 15,000 [6] 2,000 [9] 3,800	0	4,200	0	0	[8] 1,100	0	0	0	15
Minnesota	**0**	**209,700**	**0**	**14,200**	**49,000**	**0**	**23,300**	**0**	**20**	**15,000**	**459**
St. Paul	0	[5] 23,000 [2] 24,500 [6] 7,200	0	5,500	14,000	0	[8] 8,300	0	0	0	44
St. Paul	0	[5] 63,000 [2] 41,000 [6] 51,000	0	8,500	35,000	0	[8] 15,000	0	20	15,000	415
Mississippi	**68,000**	**253,800**	**0**	**20,700**	**40,635**	**5,500**	**0**	**5,000**	**217**	**17,750**	**1,260**
Purvis	0	[2] 5,800 [6] 6,000	0	4,500	0	0	0	0	0	1,750	40
Pascagoula	68,000	[5] 63,000 [2] 48,000 [6] 30,000 [9] 96,000	0	16,200	20,000	5,500	0	0	215	16,000	1,220

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Mississippi (Continued)									
Ergon Inc.									
Vicksburg	20,600	0	22,000	0	17,000	0	0	0	0
Petro Source Resources Inc. (Formerly Vicksburg Refining Inc.)									
Vicksburg	6,000	0	7,900	0	7,900	0	0	0	0
Southland Oil Co.									
Lumberton	5,800	0	6,500	0	0	0	0	0	0
Sandersville	11,000	0	12,500	0	6,050	0	0	0	0
Montana	**130,450**	**13,400**	**135,000**	**14,000**	**53,250**	**9,900**	**52,100**	**6,600**	**37,800**
Cenex									
Laurel	33,650	7,800	34,500	8,000	12,000	0	13,500	1,500	[4] 12,000
Conoco Inc.									
Billings	48,500	0	50,000	0	20,000	0	15,500	1,000	[1] 12,500
Exxon Co. U.S.A.									
Billings	42,000	0	44,000	0	18,000	[10] 7,700	21,000	3,500	[1] 10,000
Flying J Petroleum Inc.									
Cutbank	0	5,600	0	6,000	0	[12] 2,200	0	0	[1] 2,300
Montana Refining Co.									
Great Falls	6,300	0	6,500	0	3,250	0	2,100	600	[1] 1,000
Nevada	**4,500**	**0**	**4,700**	**0**	**2,500**	**0**	**0**	**0**	**0**
Nevada Refining Co.									
Tonopah	4,500	0	4,700	0	2,500	0	0	0	0
New Jersey	**434,400**	**0**	**456,400**	**0**	**244,100**	**21,500**	**251,000**	**37,000**	**77,500**
Amerada Hess Corp.									
Port Reading	0	0	0	0	0	0	50,000	0	0
Chevron U.S.A. Inc.									
Perth Amboy	80,000	0	85,000	0	46,000	0	0	0	0
Coastal Eagle Point Oil Co.									
Westville	90,000	0	95,000	0	35,000	0	45,000	12,000	[4] 26,000
Exxon Co. U.S.A.									
Linden	120,000	0	125,000	0	66,000	0	120,000	25,000	[4] 28,000
Mobil Oil Corp.									
Paulsboro	100,000	0	104,000	0	62,400	[3] 21,500	36,000	0	[1] 23,500
Seaview Petroleum Inc.									
Paulsboro	44,400	0	47,400	0	34,700	0	0	0	0
New Mexico	**75,600**	**0**	**84,607**	**0**	**13,900**	**0**	**27,100**	**6,100**	**19,200**
Bloomfield Refining Co.									
Bloomfield	16,800	0	18,107	0	0	0	5,400	500	[1] 3,400

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Mississippi (Continued)											
Vicksburg	0	[9] 5,000	0	0	12,000	0	0	5,000	2	0	0
Vicksburg	0	0	0	0	0	0	0	0	0	0	0
Lumberton	0	0	0	0	3,575	0	0	0	0	0	0
Sandersville	0	0	0	0	5,060	0	0	0	0	0	0
Montana	**4,900**	**121,400**	**4,000**	**12,180**	**26,700**	**0**	**4,650**	**0**	**19**	**2,175**	**37**
Laurel	0	[2] 18,000 [6] 15,000	4,000	3,780	8,000	0	[7] 1,250	0	0	0	37
Billings	0	[6] 3,500 [9] 38,000	0	5,000	6,500	0	[7] 3,400	0	0	0	0
Billings	4,900	[2] 15,500 [6] 20,000 [9] 6,000	0	3,400	11,000	0	0	0	19	2,175	0
Cutbank	0	[2] 2,300 [6] 900	0	0	0	0	0	0	0	0	0
Great Falls	0	[2] 1,000 [6] 1,200	0	0	1,200	0	0	0	0	0	0
Nevada	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tonopah	0	0	0	0	0	0	0	0	0	0	0
New Jersey	**0**	**264,500**	**0**	**23,000**	**94,850**	**3,500**	**25,000**	**8,500**	**16**	**5,050**	**3,592**
Port Reading	0	0	0	4,500	0	0	0	0	0	0	10
Perth Amboy	0	0	0	0	35,000	0	0	0	0	0	0
Westville	0	[2] 26,000 [6] 15,000	0	4,000	0	3,500	0	0	0	0	3,000
Linden	0	[5] 50,000 [2] 48,000 [6] 65,000	0	9,500	38,000	0	[8] 25,000	0	5	0	433
Paulsboro	0	[2] 23,500 [6] 42,000 [9] 15,000	0	5,000	0	0	0	8,500	11	5,050	149
Paulsboro	0	0	0	0	21,850	0	0	0	0	0	0
New Mexico	**0**	**29,200**	**0**	**1,200**	**4,100**	**0**	**4,000**	**0**	**0**	**0**	**0**
Bloomfield	0	[2] 3,400	0	0	0	0	0	0	0	0	0

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
New Mexico (Continued)									
Giant Refining Co.									
Gallup	18,000	0	19,000	0	7,900	0	7,200	3,600	[1] 6,800
Navajo Refining Co.									
Artesia	34,700	0	40,000	0	6,000	0	14,500	2,000	[1] 8,000
Thriftway Co.									
Bloomfield	6,100	0	7,500	0	0	0	0	0	[4] 1,000
New York	**41,850**	**0**	**45,000**	**0**	**27,000**	**0**	**0**	**0**	**0**
Cibro Petroleum Products Inc.									
Albany	41,850	0	45,000	0	27,000	0	0	0	0
North Carolina	**3,000**	**10,000**	**3,500**	**12,000**	**0**	**0**	**0**	**0**	**0**
City Gas & Transmission Corp.									
Wilmington [e]	0	10,000	0	12,000	0	0	0	0	0
GNC Energy Corp.									
Greensboro	3,000	0	3,500	0	0	0	0	0	0
North Dakota	**58,000**	**0**	**60,000**	**0**	**0**	**0**	**26,000**	**5,200**	**12,100**
Amoco Oil Co.									
Mandan	58,000	0	60,000	0	0	0	26,000	5,200	[1] 12,100
Ohio	**486,100**	**0**	**507,000**	**0**	**185,000**	**31,200**	**177,000**	**25,300**	**161,600**
Ashland Oil Inc.									
Canton	66,000	0	68,000	0	33,000	0	25,000	0	[4] 20,000
Standard Oil Co.									
Lima	171,000	0	180,000	0	54,000	[3] 17,500	37,000	7,800	[4] 54,000
Toledo	126,100	0	130,000	0	68,000	[3] 13,700	55,000	16,500	[1] 42,000
Sun Co Inc.									
Toledo	125,000	0	129,000	0	30,000	0	60,000	1,000	[1] 45,600
Oklahoma	**381,500**	**0**	**398,700**	**0**	**129,000**	**27,000**	**131,000**	**6,400**	**90,000**
Barrett Refining Corp.									
[e] Thomas	10,500	0	11,200	0	0	0	0	0	0
Conoco Inc.									
Ponca City	134,000	0	138,000	0	40,000	[3] 20,500	46,000	0	[1] 34,500
Kerr-McGee Refining Corp.									
Wynnewood	43,000	0	45,000	0	13,000	0	16,500	0	[1] 8,500
Sinclair Oil Corp.									
Tulsa	47,000	0	50,000	0	15,000	0	18,000	5,000	[1] 12,000
Sun Co Inc.									
Tulsa	85,000	0	90,000	0	29,000	[3] 6,500	28,000	1,400	[1] 23,000
Total Petroleum Inc.									
Ardmore	62,000	0	64,500	0	32,000	0	22,500	0	[4] 12,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
New Mexico (Continued)											
Gallup	0	[2] 6,800	0	1,400	700	0	[8] 4,000	0	0	0	0
Artesia	0	[2] 10,000 [6] 9,000	0	1,800	3,400	0	0	0	0	0	0
Bloomfield	0	0	0	0	0	0	0	0	0	0	0
New York	**0**	**0**	**0**	**0**	**13,000**	**0**	**0**	**0**	**0**	**0**	**0**
Albany	0	0	0	0	13,000	0	0	0	0	0	0
North Carolina	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Wilmington *	0	0	0	0	0	0	0	0	0	0	0
Greensboro	0	0	0	0	0	0	0	0	0	0	0
North Dakota	**0**	**17,000**	**0**	**3,400**	**0**	**0**	**4,000**	**0**	**0**	**0**	**17**
Mandan	0	[2] 17,000	0	3,400	0	0	[8] 4,000	0	0	0	17
Ohio	**87,000**	**190,000**	**9,000**	**25,800**	**14,500**	**17,495**	**10,693**	**5,000**	**65**	**6,390**	**238**
Canton	0	[5] 23,000 [2] 20,000 [6] 7,000	0	7,000	12,000	0	[8] 6,500	0	0	0	55
Lima	24,000	[2] 60,000	0	0	0	8,495	[7] 4,193	5,000	0	3,200	38
Toledo	35,000	[2] 40,000	0	11,000	0	0	0	0	24	3,190	100
Toledo	28,000	[2] 40,000	9,000	7,800	2,500	9,000	0	0	41	0	45
Oklahoma	**5,000**	**170,000**	**10,900**	**33,600**	**19,000**	**2,000**	**19,200**	**9,725**	**9**	**5,061**	**40**
Thomas	0	0	0	0	0	0	0	0	0	0	0
Ponca City	0	[2] 34,500 [6] 24,000	0	12,000	0	0	[7] 4,500	2,225	0	3,561	0
Wynnewood	5,000	[2] 10,000	5,000	4,600	5,000	0	[8] 2,600	0	9	0	0
Tulsa	0	[2] 12,000 [6] 5,000	0	3,000	3,200	0	[8] 8,000	0	0	0	20
Tulsa	0	[2] 24,000 [9] 10,500	5,900	7,000	4,800	2,000	[7] 3,000	7,500	0	1,500	0
Ardmore	0	[5] 32,000 [2] 18,000	0	7,000	6,000	0	[8] 1,100	0	0	0	20

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Oregon	**0**	**0**	**0**	**0**	**16,000**	**0**	**0**	**0**	**0**
Chevron U.S.A. Inc.									
Willbridge	0	0	0	0	16,000	0	0	0	0
Pennsylvania	**727,000**	**0**	**759,500**	**0**	**319,300**	**0**	**259,300**	**12,300**	**207,690**
Atlantic Refining & Marketing Corp.									
Philadelphia	125,000	0	130,000	0	83,000	0	29,000	0	[1] 60,000
BP Oil Corp.									
Marcus Hook	172,000	0	180,000	0	75,000	0	50,000	1,600	[4] 48,000
Chevron U.S.A. Inc.									
Philadelphia	174,100	0	180,000	0	80,000	0	73,300	6,500	[1] 34,000
Pennzoil Products Co.									
Rouseville	15,700	0	16,500	0	6,500	0	0	0	[4] 5,820
Quaker State Oil Refining Corp.									
Smethport	6,700	0	7,000	0	2,800	0	0	0	[1] 2,270
Sun Co Inc.									
Marcus Hook	165,000	0	175,000	0	46,000	0	87,000	4,000	[1] 39,600
United Refining Co.									
Warren	60,000	0	62,000	0	26,000	0	20,000	200	[1] 16,000
Witco Corp.									
Bradford	8,500	0	9,000	0	0	0	0	0	[1] 2,000
Tennessee	**60,000**	**0**	**65,000**	**0**	**10,000**	**0**	**30,000**	**0**	**10,000**
Mapco Petroleum Inc.									
Memphis	60,000	0	65,000	0	10,000	0	30,000	0	[4] 10,000
Texas	**3,902,900**	**236,100**	**4,170,400**	**247,000**	**1,843,700**	**377,900**	**1,602,500**	**135,200**	**1,134,200**
Amber Refining Inc.									
Fort Worth *	0	19,700	0	20,700	3,500	0	0	2,600	[4] 1,700 [1] 3,500
Amoco Oil Co.									
Texas City	400,000	0	415,000	0	195,000	[3] 38,000	194,000	43,000	[4] 63,000 [1] 97,000
Champlin Refining Co.									
Corpus Christi	155,200	0	160,000	0	75,000	[3] 29,600	55,000	2,100	[4] 52,200

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Oregon	**0**	**0**	**0**	**0**	**11,500**	**0**	**0**	**0**	**0**	**0**	**0**
Wilbridge	0	0	0	0	11,500	0	0	0	0	0	0
Pennsylvania	**51,000**	**475,020**	**16,000**	**45,500**	**33,000**	**12,300**	**11,950**	**20,200**	**58**	**0**	**440**
Philadelphia	30,000	[5] 24,000 [2] 54,000 [6] 50,000	0	0	25,000	0	0	0	45	0	203
Marcus Hook	21,000	[5] 50,000 [2] 56,000 [6] 44,000	0	10,500	0	0	[7] 4,000	0	0	0	172
Philadelphia	0	[2] 34,000 [6] 30,000	16,000	20,000	0	5,300	0	0	0	0	45
Rouseville	0	[2] 6,500 [9] 7,800	0	0	0	0	[8] 1,150	4,750	4	0	0
Smethport	0	[2] 2,520	0	0	0	0	0	2,450	0	0	0
Marcus Hook	0	[2] 54,300 [6] 27,400 [9] 6,000	0	12,000	0	7,000	0	10,000	9	0	0
Warren	0	[2] 20,000 [6] 6,000	0	3,000	8,000	0	[8] 6,800	0	0	0	20
Bradford	0	[2] 2,500	0	0	0	0	0	3,000	0	0	0
Tennessee	**0**	**33,500**	**0**	**2,500**	**0**	**0**	**0**	**0**	**0**	**0**	**45**
Memphis	0	[2] 13,500 [6] 16,000 [9] 4,000	0	2,500	0	0	0	0	0	0	45
Texas	**276,000**	**3,082,450**	**94,300**	**267,000**	**66,025**	**166,105**	**128,090**	**87,300**	**677**	**61,385**	**6,737**
Fort Worth *	0	[2] 6,400	0	300	0	0	0	0	0	0	0
Texas City	115,500	[5] 76,000 [2] 126,000 [6] 60,000	0	45,000	0	45,000	[8] 27,000	0	180	13,900	1,400
Corpus Christi	0	[5] 52,000 [2] 61,000 [6] 37,000	0	19,000	0	4,980	0	0	65	10,413	230

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Texas (Continued)									
Chevron U.S.A. Inc.									
El Paso	66,000	10,000	68,000	10,000	54,000	0	22,000	0	[4] 25,000
Port Arthur	328,500	78,400	338,000	80,000	203,200	[3] 34,000	110,000	6,000	[4] 44,100 [1] 23,000
Coastal Refining & Marketing Inc.									
Corpus Christi	90,000	0	95,000	0	45,000	[11] 11,000 [3] 12,000	18,500	0	[1] 29,000
Crown Central Petroleum Corp.									
Pasadena	100,000	0	103,000	0	38,000	[3] 12,500	56,000	0	[4] 23,000 [1] 13,000
Diamond Shamrock Refining & Marketing Co.									
Sunray	100,000	0	102,000	0	45,000	0	45,000	0	[4] 29,000
Three Rivers	45,000	0	47,000	0	20,000	0	20,500	0	[4] 11,000
Donna Refinery Partners Ltd. (Formerly Listo Petroleum Co.)									
Donna	0	4,750	0	5,000	0	0	0	0	0
El Paso Refining Co. Ltd.									
El Paso	21,600	0	22,600	0	0	[3] 4,000	7,000	1,000	[1] 6,000
Exxon Co. U.S.A.									
Baytown	426,000	67,000	448,000	69,000	258,000	[12] 28,000	155,000	15,000	[4] 123,000
Fina Oil & Chemical Co.									
Big Springs	55,000	0	60,000	0	25,000	[11] 3,500	23,000	0	[4] 20,000
Port Arthur	90,000	0	110,000	0	50,000	0	36,000	0	[4] 30,000
Hill Petroleum Co.									
Houston	65,000	0	69,000	0	28,000	[11] 7,500	50,000	0	[1] 13,500
Howell Hydrocarbons Corp.									
San Antonio	4,500	0	5,000	0	0	0	0	0	[1] 1,200
Koch Refining Co.									
Corpus Christi	125,000	0	130,000	0	42,000	[3] 12,000	42,500	800	[4] 15,000 [1] 12,000
La Gloria Oil & Gas Co.									
Tyler	47,000	0	49,500	0	14,000	[3] 9,300	15,000	800	[4] 12,000 [1] 4,600
Leal Petroleum Corp.									
Nixon	15,900	5,000	17,100	7,500	0	0	0	0	0
Liquid Energy Corp.									
Bridgeport	0	10,000	0	10,800	0	0	0	0	0
Lyondell Petrochemical Co.									
Houston	260,000	0	314,000	0	127,000	[3] 45,000	85,000	0	[4] 25,000 [1] 83,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Texas (Continued)											
El Paso	0	[2] 25,000 [6] 18,000	0	5,500	5,500	0	[7] 3,000	0	0	0	47
Port Arthur	0	[5] 40,000 [2] 67,100 [6] 98,000 [9] 13,900	5,000	16,900	0	12,500	[8] 7,200	9,000	0	9,200	532
Corpus Christi	11,000	[5] 25,000 [2] 32,000 [6] 24,000	0	3,000	5,000	5,500	[8] 5,200	0	24	4,452	85
Pasadena	0	[2] 28,000 [6] 7,000	0	10,000	0	2,000	0	0	0	1,500	16
Sunray	0	[2] 35,500	15,000	9,000	5,000	0	0	0	0	0	25
Three Rivers	0	[2] 11,000	7,000	6,000	500	0	0	1,000	0	0	0
Donna	0	0	0	0	0	0	0	0	0	0	0
El Paso	0	[2] 6,000	0	2,400	0	0	[7] 700	0	0	300	0
Baytown	19,000	[5] 95,000 [2] 162,500 [6] 223,000 [9] 44,100	35,000	29,000	7,000	0	0	31,200	85	500	1,238
Big Springs	0	[5] 6,000 [2] 25,000 [6] 11,000	10,000	6,000	5,500	0	0	0	0	0	50
Port Arthur	18,500	[2] 35,000 [6] 32,000 [9] 15,000	18,000	4,500	2,000	8,500	[8] 8,000	0	0	0	170
Houston	0	[2] 16,000 [6] 30,000	0	5,500	5,000	2,800	0	0	0	0	200
San Antonio	0	0	0	0	0	1,200	0	0	0	0	0
Corpus Christi	0	[2] 28,000 [6] 9,000	0	8,400	0	7,300	0	0	0	2,000	50
Tyler	0	[2] 20,000	0	4,700	0	0	[7] 500 [8] 2,500	0	17	1,200	11
Nixon	0	[2] 9,500 [6] 8,000 [9] 1,000	0	0	0	0	[7] 1,000 [8] 1,000	0	0	0	0
Bridgeport	0	0	0	0	0	0	0	0	0	0	0
Houston	0	[5] 82,000 [2] 132,000 [6] 93,000 [9] 6,600	0	0	0	36,000	0	6,600	0	10,900	392

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Texas (Continued)									
Marathon Petroleum Co.									
Texas City	69,500	0	74,000	0	27,000	0	39,000	1,000	[1] 9,000
Mobil Oil Corp.									
Beaumont	275,000	0	290,000	0	86,000	[3] 29,500	102,000	0	[4] 46,000 [1] 57,000
Petrolite Corp.									
Kilgore	1,000	0	1,400	0	400	0	0	0	0
Phillips 66 Co.									
Borger	105,000	0	110,000	0	0	0	60,000	10,400	[1] 26,000
Sweeny	175,000	0	195,000	0	83,000	0	87,000	12,000	[1] 36,000
Pride Refining Inc.									
Abilene	28,500	14,250	30,000	15,000	12,500	0	0	0	0
Shell Oil Co.									
Deer Park	214,000	0	225,000	0	89,000	[11] 55,000 [12] 18,000	65,000	5,000	[4] 44,000 [1] 20,000
Odessa	28,600	0	29,500	0	10,000	0	10,500	0	[1] 11,000
South Hampton Refining Co.									
Silsbee	0	0	0	0	0	0	0	0	[4] 400
Southwestern Refining Co. Inc.									
Corpus Christi	104,000	0	108,000	0	36,000	0	52,000	0	[1] 30,000
Texaco Refining & Marketing Inc.									
Port Arthur/Port Neches	250,000	0	278,000	0	143,100	0	110,000	31,500	[4] 40,000
Texas City Refining Inc.									
Texas City	119,600	0	130,000	0	54,000	[11] 19,000	43,500	0	[1] 23,000
Trifinery									
Corpus Christi	0	27,000	0	29,000	15,000	[11] 10,000	0	0	0
Unocal Corp.									
Nederland	120,000	0	126,300	0	43,000	0	39,000	4,000	[4] 20,000 [1] 12,000
Valero Refining Co.									
Corpus Christi	19,000	0	20,000	0	22,000	0	60,000	0	0
Utah	**154,500**	**0**	**160,000**	**0**	**45,380**	**8,500**	**54,800**	**10,600**	**28,550**
Amoco Oil Co.									
Salt Lake City	40,000	0	41,500	0	0	0	18,000	4,000	[1] 7,650
Big West Oil Co.									
North Salt Lake	24,000	0	25,000	0	3,800	0	4,400	2,500	[1] 5,000
Chevron U.S.A. Inc.									
Salt Lake City	45,000	0	46,000	0	35,500	[3] 8,500	18,000	1,000	[1] 5,500
Crysen Refining Inc.									
Woods Cross	12,500	0	13,000	0	2,880	0	0	0	[4] 2,400

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting[3]	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Texas (Continued)											
Texas City	0	0	0	10,000	0	2,500	0	0	0	0	0
Beaumont	32,000	[2] 92,000 [6] 116,000 [9] 5,650	0	13,000	0	0	[8] 20,000	8,300	60	7,020	110
Kilgore	0	0	0	0	125	0	0	0	0	0	0
Borger	0	[2] 26,500 [6] 40,000 [9] 50,000	0	14,000	0	0	[7] 10,100 [8] 24,600	0	50	0	381
Sweeny	0	[2] 53,000 [6] 50,000 [9] 75,000	0	10,500	0	5,575	[8] 16,900	0	80	0	420
Abilene	0	0	0	0	0	0	0	0	0	0	0
Deer Park	65,000	[5] 45,000 [2] 65,000 [6] 82,500 [9] 49,000	4,300	8,100	5,900	20,000	0	10,700	65	0	577
Odessa	0	[2] 11,000	0	3,300	0	350	0	0	0	0	0
Silsbee	0	[2] 1,600 [9] 500	0	0	0	400	[8] 390	0	1	0	0
Corpus Christi	0	[5] 18,000 [2] 40,300 [6] 27,000	0	4,500	0	6,500	0	0	0	0	129
Port Arthur/Port Neches	15,000	[2] 40,000 [6] 80,000 [9] 18,500	0	9,000	14,000	0	0	17,400	0	0	262
Texas City	0	[2] 23,000 [6] 29,000	0	6,200	0	0	0	0	0	0	31
Corpus Christi	0	0	0	0	8,000	0	0	0	0	0	0
Nederland	0	[2] 53,600	0	4,200	2,500	5,000	0	3,100	0	0	16
Corpus Christi	0	[9] 58,000	0	9,000	0	0	0	0	50	0	365
Utah	**2,000**	**39,250**	**5,000**	**11,400**	**3,200**	**0**	**4,750**	**0**	**0**	**1,750**	**13**
Salt Lake City	0	[2] 7,650	0	4,000	0	0	[7] 1,400	0	0	0	0
North Salt Lake	0	[2] 6,000	0	1,000	0	0	0	0	0	0	0
Salt Lake City	0	[2] 5,500 [6] 5,500	0	4,300	0	0	[7] 750	0	0	1,750	13
Woods Cross	0	0	0	0	1,500	0	0	0	0	0	0

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Utah (Continued)									
Pennzoil Products Co.									
(Formerly Seagull Refining Co.)									
Roosevelt	8,000	0	8,500	0	0	0	5,000	500	[1] 2,000
Phillips 66 Co.									
Woods Cross	25,000	0	26,000	0	3,200	0	8,400	2,600	[1] 6,000
Virginia	**53,400**	**0**	**55,550**	**0**	**29,000**	**13,500**	**27,000**	**2,000**	**9,500**
Amoco Oil Co.									
Yorktown	51,000	0	53,000	0	29,000	[3] 13,500	27,000	2,000	[4] 9,500
Primary Oil & Energy Corp.									
Chester	2,400	0	2,550	0	0	0	0	0	0
Washington	**451,900**	**0**	**470,754**	**0**	**218,500**	**68,000**	**100,000**	**19,500**	**119,800**
Arco Petroleum Products Co.									
Ferndale	162,000	0	170,000	0	95,000	[3] 50,000	0	0	[4] 56,000
Chevron U.S.A. Inc.									
Richmond Beach	0	0	0	0	6,000	0	0	0	0
Mobil Oil Corp.									
Ferndale	77,000	0	79,000	0	28,000	0	25,500	2,000	[4] 11,300
Shell Oil Co.									
Anacortes	82,000	0	85,000	0	35,500	0	39,500	8,500	[4] 25,000
Sound Refining Inc.									
Tacoma	11,900	0	12,754	0	6,000	0	0	0	0
Texaco Refining & Marketing Inc.									
Anacortes	87,000	0	90,000	0	30,000	[3] 18,000	35,000	9,000	[1] 21,000
U.S. Oil & Refining Co.									
Tacoma	32,000	0	34,000	0	18,000	0	0	0	[1] 6,000
West Virginia	**16,808**	**0**	**17,500**	**0**	**9,675**	**0**	**0**	**0**	**3,750**
Mid Atlantic Fuels Inc.									
(Formerly Quaker State Oil Refining Corp.)									
St. Mary's	4,658	0	5,000	0	2,175	0	0	0	[1] 1,600
Quaker State Oil Refining Corp.									
Newell	12,150	0	12,500	0	7,500	0	0	0	[4] 2,150
Wisconsin	**32,000**	**0**	**34,000**	**0**	**20,500**	**0**	**9,700**	**1,000**	**8,000**
Murphy Oil U.S.A. Inc.									
Superior	32,000	0	34,000	0	20,500	0	9,700	1,000	[4] 8,000
Wyoming	**164,555**	**350**	**170,300**	**400**	**75,000**	**9,000**	**62,000**	**12,200**	**32,250**
Amoco Oil Co.									
Casper	40,000	0	41,000	0	16,000	0	13,500	2,700	[1] 7,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Utah (Continued)											
Roosevelt	2,000	[2] 2,000	0	0	0	0	0	0	0	0	0
Woods Cross	0	[2] 11,000 [6] 1,600	5,000	2,100	1,700	0	[6] 2,600	0	0	0	0
Virginia	**0**	**25,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5,100**	**73**
Yorktown	0	[2] 9,500 [6] 15,500	0	0	0	0	0	0	0	5,100	73
Chester	0	0	0	0	0	0	0	0	0	0	0
Washington	**52,000**	**190,800**	**20,000**	**23,400**	**16,000**	**0**	**2,750**	**0**	**80**	**16,400**	**254**
Ferndale	52,000	[2] 36,000 [6] 18,000	0	0	0	0	0	0	80	12,500	180
Richmond Beach	0	0	0	0	5,000	0	0	0	0	0	0
Ferndale	0	[2] 13,500 [6] 15,000	0	5,900	0	0	0	0	0	0	21
Anacortes	0	[5] 7,500 [2] 25,000 [6] 20,000	15,000	10,900	0	0	[7] 2,750	0	0	0	0
Tacoma	0	0	0	0	3,000	0	0	0	0	0	0
Anacortes	0	[2] 21,000 [6] 13,000 [9] 10,000	5,000	6,600	0	0	0	0	0	3,900	46
Tacoma	0	[5] 3,800 [2] 6,000	0	0	8,000	0	0	0	0	0	7
West Virginia	**4,440**	**0**	**0**	**0**	**0**	**0**	**0**	**4,571**	**1**	**0**	**0**
St. Mary's	0	0	0	0	0	0	0	1,306	0	0	0
Newell	4,440	0	0	0	0	0	0	3,265	1	0	0
Wisconsin	**0**	**14,800**	**0**	**1,400**	**13,500**	**0**	**0**	**0**	**0**	**0**	**14**
Superior	0	[2] 9,000 [6] 5,800	0	1,400	13,500	0	0	0	0	0	14
Wyoming	**0**	**48,800**	**0**	**9,650**	**16,950**	**0**	**3,500**	**1,600**	**0**	**3,250**	**42**
Casper	0	[2] 4,100	0	2,500	550	0	0	1,600	0	0	0

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil
E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming
	Operating	Idle	Operating	Idle			Fresh	Recycled	
Wyoming (Continued)									
Frontier Refining Co.									
Cheyenne	33,500	0	35,300	0	17,000	[3] 9,000	12,000	500	[1] 6,500
Little America Refining Co.									
Evansville	24,500	0	25,500	0	12,000	0	10,500	5,000	[1] 6,000
Mountaineer Refining Co. Inc.									
La Barge	0	350	0	400	0	0	0	0	0
Sinclair Oil Corp.									
Sinclair	54,000	0	55,000	0	30,000	0	21,000	1,000	[1] 10,000
Wyoming Refining Co.									
Newcastle	12,555	0	13,500	0	0	0	5,000	3,000	[1] 2,750
U.S. Total	**15,017,968**	**897,450**	**15,831,483**	**993,075**	**7,198,245**	**2,080,300**	**5,424,150**	**381,425**	**3,891,290**
Guam	**0**	**43,900**	**0**	**47,100**	**1,400**	**0**	**0**	**0**	**0**
Guam Oil & Refining Co. Inc.									
Agana *	0	43,900	0	47,100	1,400	0	0	0	0
Puerto Rico	**121,000**	**0**	**128,000**	**0**	**65,000**	**0**	**13,500**	**0**	**54,500**
Caribbean Gulf Refining Corp. (Formerly Chevron U.S.A. Inc.)									
San Juan	36,000	0	41,000	0	20,000	0	13,500	0	[4] 6,500
Phillips Puerto Rico Core Inc.									
Guayama	0	0	0	0	0	0	0	0	[4] 36,000 [1] 12,000
Sun Oil Inc.									
Yabucoa	85,000	0	87,000	0	45,000	0	0	0	0
Virgin Islands	**470,000**	**75,000**	**510,000**	**85,000**	**215,000**	**85,000**	**0**	**0**	**115,000**
Amerada Hess Corp.									
St. Croix	470,000	75,000	510,000	85,000	215,000	[11] 85,000	0	0	[4] 90,000 [1] 25,000

Table 31. Capacity of Operable Petroleum Refineries by State as of January 1, 1988 (Continued)
(Barrels per Stream Day, Except Where Noted)

Location	Downstream Charge Capacity (Cont.)			Production Capacity							
	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/day)
Wyoming (Continued)											
Cheyenne	0	[2] 7,500 [6] 4,500	0	2,750	7,000	0	[7] 1,500	0	0	2,250	24
Evansville	0	[6] 3,700	0	0	4,400	0	0	0	0	0	0
La Barge	0	0	0	0	0	0	0	0	0	0	0
Sinclair	0	[2] 14,000 [6] 12,000	0	3,500	5,000	0	[7] 2,000	0	0	1,000	18
Newcastle	0	0	0	900	0	0	0	0	0	0	0
U.S. Total	**1,202,030**	**9,169,803**	**240,200**	**993,040**	**788,018**	**288,559**	**465,268**	**232,221**	**2,418**	**368,308**	**27,639**
Guam	**0**	**0**	**0**	**0**	**350**	**0**	**0**	**0**	**0**	**0**	**0**
Agana *	0	0	0	0	350	0	0	0	0	0	0
Puerto Rico	**15,000**	**77,800**	**0**	**0**	**1,000**	**15,000**	**0**	**9,000**	**18**	**0**	**80**
San Juan	0	[2] 6,800 [6] 11,000	0	0	1,000	0	0	0	0	0	12
Guayama	0	[2] 50,000	0	0	0	15,000	0	0	0	0	0
Yabucoa	15,000	[5] 10,000	0	0	0	0	0	9,000	18	0	68
Virgin Islands	**0**	**420,000**	**0**	**0**	**0**	**35,000**	**18,000**	**0**	**0**	**0**	**580**
St. Croix	0	[5] 130,000 [2] 125,000 [6] 165,000	0	0	0	35,000	[9] 18,000	0	0	0	580

[1] High Pressure [2] Naphtha/Reformer Feeds [3] Delayed Coking [4] Low Pressure [5] Heavy Gas Oil [6] Distillate
[7] C_4 [8] C_5 and C_6 [9] Other/Residual [10] Fluid Coking [11] Visbreaking [12] Other/Gas Oil

E = Estimated. MMcfd = Million cubic feet per day.
* Reported no inputs during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 32. Refiners' Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 1988

Refiner	Barrels per Calendar Day
Companies with Capacity Over 100,000 B/CD	
Chevron U.S.A. Inc.	**1,902,000**
Port Arthur, Texas	406,900
El Segundo, California	405,000
Richmond, California	350,000
Pascagoula, Mississippi	295,000
Philadelphia, Pennsylvania	174,100
Perth Amboy, New Jersey	80,000
El Paso, Texas	76,000
Honolulu, Hawaii	48,000
Salt Lake City, Utah	45,000
Kenai, Alaska	22,000
Exxon Co. U.S.A.	**1,236,000**
Baytown, Texas	493,000
Baton Rouge, Louisiana	455,000
Benicia, California	126,000
Linden, New Jersey	120,000
Billings, Montana	42,000
Shell Oil Co	**1,065,700**
Wood River, Illinois	274,000
Norco, Louisiana	215,000
Deer Park, Texas	214,000
Martinez, California	140,100
Carson, California	112,000
Anacortes, Washington	82,000
Odessa, Texas	28,600
Amoco Oil Co.	**967,000**
Texas City, Texas	400,000
Whiting, Indiana	350,000
Mandan, North Dakota	58,000
Yorktown, Virginia	51,000
Salt Lake City, Utah	40,000
Casper, Wyoming	40,000
Savannah, Georgia	28,000
Texaco Refining & Marketing Inc.	**881,500**
Port Arthur/Port Neches, Texas	250,000
Convent, Louisiana	225,000
Delaware City, Delaware	140,000
Anacortes, Washington	87,000
El Dorado, Kansas	81,500
Wilmington, California	57,000
Bakersfield, California	41,000
Mobil Oil Corp.	**755,000**
Beaumont, Texas	275,000
Joliet, Illinois	180,000
Torrance, California	123,000
Paulsboro, New Jersey	100,000
Ferndale, Washington	77,000
Atlantic Richfield Co.	**668,000**
Arco Petroleum Products Co.	
Carson, California	214,000
Ferndale, Washington	162,000
Lyondell Petrochemical Co.	
Houston, Texas	260,000
Arco Alaska Inc.	
Prudhoe Bay, Alaska	20,000
Anchorage, Alaska	12,000
Standard Oil Co.	**667,600**
Belle Chasse, Louisiana	198,500
Lima, Ohio	171,000
Toledo, Ohio	126,100
BP Oil Corp.	
Marcus Hook, Pennsylvania	172,000
U.S. Steel Corp.	**588,000**
Marathon Petroleum Co.	
Garyville, Louisiana	255,000
Robinson, Illinois	195,000
Texas City, Texas	69,500
Detroit, Michigan	68,500
Unocal Corp.	**497,000**
Lemont, Illinois	151,000
Nederland, Texas	120,000
Wilmington, California	108,000
Rodeo, California	77,000
Arroyo Grande, California	41,000
E I Du Pont De Nemours & Co.	**394,300**
Conoco Inc.	
Westlake, Louisiana	156,500
Ponca City, Oklahoma	134,000
Billings, Montana	48,500
Commerce City, Colorado	43,000
Santa Maria, California	9,500
Egan, Louisiana	2,800
Sun Co Inc.	**375,000**
Marcus Hook, Pennsylvania	165,000
Toledo, Ohio	125,000
Tulsa, Oklahoma	85,000
Ashland Oil Inc.	**346,543**
Catlettsburg, Kentucky	213,400
St. Paul, Minnesota	67,143
Canton, Ohio	66,000
Coastal Corp., The	**320,800**
Coastal Eagle Point Oil Co.	
Westville, New Jersey	90,000
Coastal Refining & Marketing Inc.	
Corpus Christi, Texas	90,000
Derby Refining Co.	
El Dorado, Kansas	30,400
Wichita, Kansas	28,800
Pacific Refining Co. Inc.	
Hercules, California	55,000
Belcher Oil Co.	
Chickasaw, Alabama	26,600
Citgo Petroleum Corp./Petroleos De Venezuela	
Citgo Petroleum Corp.	
Lake Charles, Louisiana	**320,000**
Phillips 66 Co.	**305,000**
Sweeny, Texas	175,000
Borger, Texas	105,000
Woods Cross, Utah	25,000

See footnotes at end of table.

Table 32. Refiners' Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 1988 (Continued)

Refiner	Barrels per Calendar Day
Trans America Refining Co. *	
Good Hope, Louisiana	**300,000**
Koch Industries Inc.	**280,000**
Koch Refining Co.	
St. Paul, Minnesota	155,000
Corpus Christi, Texas	125,000
Total Petroleum Inc.	**191,100**
Ardmore, Oklahoma	62,000
Arkansas City, Kansas	53,600
Alma, Michigan	42,000
Colorado Refining Co. [1]	
Commerce City, Colorado	33,500
Kerr-McGee Corp.	**164,800**
Southwestern Refining Co. Inc.	
Corpus Christi, Texas	104,000
Kerr-McGee Refining Corp.	
Wynnewood, Oklahoma	43,000
Dubach, Louisiana	10,000
Cotton Valley, Louisiana	7,800
Solomon Inc.	**155,700**
Hill Petroleum Co.	
Houston, Texas	65,000
Krotz Springs, Louisiana	56,000
St.Rose, Louisiana	34,700
Union Pacific Corp./Petroleos De Venezuela	
Champlin Refining Co.	
Corpus Christi, Texas	**155,200**
Mapco Petroleum Inc.	**150,000**
North Pole, Alaska	90,000
Memphis, Tennessee	60,000
Diamond Shamrock Refining & Marketing Co.	**145,000**
Sunray, Texas	100,000
Three Rivers, Texas	45,000
Fina Oil & Chemical Co.	**145,000**
Port Arthur, Texas	90,000
Big Springs, Texas	55,000
Tenneco Oil Co.	
Chalmette, Louisiana	**145,000**
Apex Oil Co.	**128,200**
Clark Oil & Refining Corp.	
Blue Island, Illinois	64,600
Hartford, Illinois	63,600
Tosco Corp.	
Martinez, California	**126,000**
Sinclair Oil Corp.	**125,500**
Sinclair, Wyoming	54,000
Tulsa, Oklahoma	47,000
Little America Refining Co.	
Evansville, Wyoming	24,500
Atlantic Refining & Marketing Corp.	
Philadelphia, Pennsylvania	**125,000**
Murphy Oil U.S.A. Inc.	**124,500**
Meraux, Louisiana	92,500
Superior, Wisconsin	32,000
Agway Petroleum Corp.	
Texas City Refining Inc.	
Texas City, Texas	**119,600**
Total	**13,870,043**
Companies with Capacity 30,001 to 100,000 B/CD	
Crown Central Petroleum Corp.	
Pasadena, Texas	**100,000**
Farmland Industries Inc.	**82,900**
Coffeyville, Kansas	56,500
Phillipsburg, Kansas	26,400
LL&E Petroleum Marketing	
Saraland, Alabama	**80,000**
National Cooperative Refinery Association	
McPherson, Kansas	**75,600**
Tesoro Petroleum Corp.	
Kenai, Alaska	**72,000**
Pennzoil Products Co.	**69,900**
Shreveport, Louisiana	46,200
Rouseville, Pennsylvania	15,700
Roosevelt, Utah [2]	8,000
Coral Petroleum Co.	**69,500**
United Refining Co.	
Warren, Pennsylvania	60,000
Vulcan Refining Co.	
Cordova, Alabama	9,500
Pacific Resources Inc.	
Hawaiian Independent Refinery Inc.	
Ewa Beach, Hawaii	**67,900**
Union Pacific Resources Co. [3]	
Wilmington, California	**65,000**
Lion Oil Co.	
El Dorado, Arkansas	**48,000**
Paramount Petroleum Corp.	
Paramount, California	**46,500**
Placid Refining Co.	
Port Allen, Louisiana	**46,000**
Texas Eastern Corp.	
La Gloria Oil & Gas Co.	
Tyler, Texas	**46,000**
Seaview Petroleum Inc.	
Paulsboro, New Jersey	**44,400**

See footnotes at end of table.

Table 32. Refiners' Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 1988 (Continued)

Refiner	Barrels per Calendar Day
Rock Island Refining Corp.	
Indianapolis, Indiana	**43,000**
Pride Refining Inc.	
Abilene, Texas	**42,750**
Thrifty Oil Co.	
Golden West Refining Co.	
Santa Fe Springs, California	**42,000**
Cirillo Brothers Oil Co.	
Cibro Petroleum Products Inc.	
Albany, New York	**41,850**
Triad Terminal Corp.	
Edgington Oil Co. Inc.	
Long Beach, California	**41,600**
Cenex	
Laurel, Montana	**41,450**
Holly Corp.	**41,000**
Navajo Refining Co.	
Artesia, New Mexico	34,700
Montana Refining Co.	
Great Falls, Montana	6,300
Sargent Holdings Ltd.	
Powerine Oil Co.	
Santa Fe Springs, California	**35,000**
Frontier Refining Co.	
Cheyenne, Wyoming	**33,500**
Hunt Oil Co.	
Tuscaloosa, Alabama	**33,500**
Time Oil Co.	
U.S. Oil & Refining Co.	
Tacoma, Washington	**32,000**
Young Refining Corp.	**31,355**
Douglasville, Georgia	5,655
Seminole Refining Corp.	
St. Marks, Florida	17,000
Laketon Refining Corp.	
Laketon, Indiana	8,700
Total	**1,372,705**
Companies with Capacity 10,001 to 30,000 B/CD	
Amerada Hess Corp.	
Purvis, Mississippi	**30,000**
Flying J Petroleum Inc.	**29,600**
Cutbank, Montana	5,600
Big West Oil Co.	
North Salt Lake, Utah	24,000
Fletcher Oil & Refining Co.	
Carson, California	**29,500**
GAMXX Energy Inc.[4] *	
Theodore, Alabama	**27,000**
Trifinery	
Corpus Christi, Texas	**27,000**
Crysen Corp.	**24,400**
Crysen Refining Inc.	
Woods Cross, Utah	12,500
Sound Refining Inc.	
Tacoma, Washington	11,900
San Joaquin Refining Co. Inc.	
Bakersfield, California	**24,300**
Pauley Petroleum Inc.	
Newhall Refining Co. Inc.	
Newhall, California	**22,500**
El Paso Refining Co. Ltd.	
El Paso, Texas	**21,600**
Kern Oil & Refining Co.	
Bakersfield, California	**21,400**
Indiana Farm Bureau Cooperative Association	
Mount Vernon, Indiana	**21,200**
Leal Petroleum Corp.	
Nixon, Texas	**20,900**
Ergon Inc.	
Vicksburg, Mississippi	**20,600**
E-Z Serv Inc.	
Amber Refining Inc.	
Fort Worth, Texas	**19,700**
Valero Refining Co.	
Corpus Christi, Texas	**19,000**
Quaker State Oil Refining Corp.	**18,850**
Newell, West Virginia	12,150
Smethport, Pennsylvania	6,700
Giant Refining Co.	
Gallup, New Mexico	**18,000**
Texas NAPCO Inc.	
St. James, Louisiana	**17,000**
Gary Energy Corp.	
Bloomfield Refining Co.	
Bloomfield, New Mexico	**16,800**
VGS Corp.	**16,800**
Southland Oil Co.	
Sandersville, Mississippi	11,000
Lumberton, Mississippi	5,800
Huntway Refining Co.	**14,100**
Benicia, California	8,600
Wilmington, California	5,500

See footnotes at end of table.

Table 32. Refiners' Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 1988 (Continued)

Refiner	Barrels per Calendar Day
MacMillan Petroleum Co. Signall Hill, California	14,000
Calcasieu Refining Co. Lake Charles, Louisiana	13,500
Wyoming Refining Co. Newcastle, Wyoming	12,555
World Oil Co. Sunland Refining Corp. Bakersfield, California	12,000
Barrett Refining Corp. Thomas, Oklahoma	10,500
Total	**522,805**
Companies with Capacity 10,000 B/CD or Less	
City Gas & Transmission Corp. Wilmington, North Carolina	10,000
Mitchell Energy & Development Corp. Liquid Energy Corp. Bridgeport, Texas	10,000
Gibson Oil & Refining Co. Inc. Bakersfield, California	9,600
Witco Corp. Bradford, Pennsylvania	8,500
Lunday Thagard Co. South Gate, California	8,100
Anchor Gasoline Corp. Canal Refining Co. Church Point, Louisiana	8,000
Claiborne Gasoline Co. Lisbon, Louisiana	7,500
Moore & Munger Marketing & Refining Inc. Cross Oil & Refining Co. of Arkansas Smackover, Arkansas	6,700
Petro Star North Pole, Alaska	6,700
Thriftway Co. Bloomfield, New Mexico	6,100
Petro Source Resources Inc. [5] * Vicksburg, Mississippi	6,000
Somerset Refinery Inc. Somerset, Kentucky	5,500
OGC Corp. [6] Egan, Louisiana	5,000
West Coast Oil Co. Oildale, California	5,000
Donna Refinery Partners Ltd. [7] * Donna, Texas	4,750
Mid Atlantic Fuels Inc. [8] St. Mary's, West Virginia	4,658
Howell Hydrocarbons Corp. San Antonio, Texas	4,500
Nevada Refining Co. Tonopah, Nevada	4,500
Calumet Refining Co. Princeton, Louisiana	4,207
Oxnard Refinery Oxnard, California	4,000
Warrior Asphalt Refining Corp. Holt, Alabama	4,000
Martin Gas Sales Inc. Berry Petroleum Co. Stephens, Arkansas	3,700
Crystal Refining Co. Carson City, Michigan	3,000
GNC Energy Corp. Greensboro, North Carolina	3,000
Primary Oil & Energy Corp. Chester, Virginia	2,400
Kentucky Oil & Refining Co.	1,600
Troy, Indiana	1,000
Betsy Lane, Kentucky	600
Motor Oils Refining Co. McCook, Illinois	1,500
Petrolite Corp. Kilgore, Texas	1,000
Mountaineer Refining Co. Inc. La Barge, Wyoming	350
Total	**149,865**
U.S. Total	**15,915,418**

[1] Formerly Asamera Oil(US) Inc.
[2] Formerly Seagull Refining Co.
[3] Formerly Champlin Petroleum Co.
[4] Formerly Marion Corp.
[5] Formerly Vicksburg Refining Inc.
[6] Formerly Louisiana Oil Refg. Co. of Egan.
[7] Formerly Listo Petroleum Co.
[8] Formerly Quaker State Oil Refining Corp.
* Refinery was reactivated during 1987.
Source: Form EIA-820, "Annual Refinery Report."

Table 33. **Operable Crude and Downstream Charge Capacity of Petroleum Refineries, January 1, 1981 to January 1, 1989**
(Thousand Barrels per Stream Day, Except Where Noted)

Year/PAD District	Atmospheric Crude Oil Distillation	Downstream Charge Capacity							
		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming	Catalytic Hydrocracking	Catalytic Hydrotreating	Fuels Solvent Deasphalting
				Fresh	Recycled				
Jan 1, 1981	19,763	7,033	1,587	5,543	594	4,098	909	8,467	NA
Jan 1, 1982	19,018	7,197	1,782	5,474	562	3,966	892	8,539	NA
Jan 1, 1983	17,871	7,180	1,715	5,402	488	3,918	883	8,354	NA
Jan 1, 1984	17,059	7,165	1,852	5,310	492	3,907	952	9,009	NA
Jan 1, 1985	16,504	6,998	1,858	5,232	507	3,750	1,053	8,897	NA
Jan 1, 1986	16,346	6,892	1,880	5,214	463	3,744	1,125	8,791	NA
Jan 1, 1987	16,460	6,935	1,928	5,251	466	3,805	1,189	9,083	230
Jan 1, 1988	**16,825**	**7,198**	**2,080**	**5,424**	**381**	**3,891**	**1,202**	**9,170**	**240**
PADD I	1,554	735	81	602	56	354	74	898	16
PADD II	3,435	1,273	371	1,226	63	907	162	1,830	40
PADD III	7,915	3,363	1,024	2,644	187	1,811	493	4,612	105
PADD IV	560	197	27	192	30	116	7	237	9
PADD V	3,360	1,630	577	759	45	703	466	1,594	70
Jan 1, 1989	**16,871**	**7,251**	**2,080**	**5,437**	**382**	**3,899**	**1,223**	**9,308**	**240**
PADD I	1,554	749	81	602	56	354	74	913	16
PADD II	3,485	1,303	371	1,226	63	907	151	1,835	40
PADD III	7,924	3,371	1,024	2,657	187	1,818	525	4,662	105
PADD IV	560	197	27	192	30	116	7	237	9
PADD V	3,348	1,631	577	759	45	703	466	1,662	70
1988-1989 (Net Change)	**47**	**53**	**0**	**13**	**1**	**8**	**21**	**138**	**0**
PADD I	0	14	0	0	0	0	0	15	0
PADD II	50	30	0	0	0	0	-11	5	0
PADD III	9	9	0	13	1	8	32	51	0
PADD IV	0	(s)	0	0	0	0	0	0	0
PADD V	-12	(s)	0	0	0	0	0	68	0

NA = Not Available.
(s) = Less than 500 barrels per stream day.
Note: Totals may not equal sum of components due to independent rounding.
Source: Form EIA-820, "Annual Refinery Report."

Table 34. Operable Production Capacity of Petroleum Refineries, January 1, 1981 to January 1, 1989
(Thousand Barrels per Stream Day, Except Where Noted)

Year/PAD District	Production Capacity							
	Alkylates	Asphalt	Aromatics	Isomers	Lubricants	Hydrogen (MMcfd)	Marketable Petroleum Coke	Sulfur (short tons/ day)
Jan 1, 1981	974	765	299	131	234	2,054	276	NA
Jan 1, 1982	984	740	290	162	242	1,944	267	NA
Jan 1, 1983	960	722	237	212	241	2,298	296	NA
Jan 1, 1984	945	800	218	208	241	2,444	407	NA
Jan 1, 1985	917	767	215	219	243	2,572	424	NA
Jan 1, 1986	941	804	276	258	246	2,357	356	NA
Jan 1, 1987	974	788	287	326	250	2,569	364	23,806
Jan 1, 1988	**993**	**788**	**289**	**465**	**232**	**2,418**	**368**	**27,639**
PADD I	77	174	19	37	33	115	21	4,455
PADD II	258	231	55	145	37	181	75	3,356
PADD III	485	207	210	249	133	1,077	149	11,257
PADD IV	34	51	0	13	2	19	7	119
PADD V	139	125	4	21	27	1,026	116	8,452
Jan 1, 1989	**1,006**	**810**	**296**	**465**	**233**	**2,494**	**368**	**28,057**
PADD I	77	174	19	37	33	116	21	4,455
PADD II	259	251	55	145	37	181	75	3,356
PADD III	491	209	217	249	134	1,077	149	11,307
PADD IV	35	51	0	13	2	19	7	119
PADD V	144	125	4	21	27	1,101	116	8,820
1988-1989	**13**	**22**	**7**	**0**	**1**	**76**	**0**	**418**
(Net Change)								
PADD I	0	0	0	0	0	1	0	0
PADD II	1	20	0	0	0	0	0	0
PADD III	6	2	7	0	1	0	0	50
PADD IV	1	0	0	0	0	0	0	0
PADD V	5	0	0	0	0	75	0	368

NA = Not Available. MMcfd = Million cubic feet per day.
Note: Totals may not equal sum of components due to independent rounding.
Source: Form EIA-820, "Annual Refinery Report."

Table 35. Working Storage Capacity [1] at Refineries and Gasoline Blending Plants by PAD District and State as of January 1, 1988
(Thousand Barrels)

District and State	Crude Oil	Products						
		Motor Gasoline			Gasoline Blending Components	Middle Distillates	Residual Fuel Oil	Asphalt and Road Oil
		Finished Leaded	Finished Unleaded	Total				
PAD District I	**23,664**	**3,320**	**13,069**	**16,389**	**10,444**	**20,660**	**12,551**	**4,736**
New Jersey	7,837	1,555	5,986	7,541	5,601	11,091	6,361	1,691
Pennsylvania	10,284	917	3,188	4,105	2,669	3,948	2,392	1,102
Other States [3]	5,543	848	3,895	4,743	2,174	5,621	3,798	1,943
PAD District II	**23,699**	**10,206**	**15,856**	**26,062**	**15,787**	**24,692**	**6,274**	**11,615**
Illinois	6,431	2,374	3,903	6,277	4,563	6,515	1,592	1,932
Indiana	2,530	811	1,974	2,785	2,639	3,168	1,479	2,068
Kansas	2,902	2,153	2,673	4,826	1,424	3,312	541	865
Kentucky	1,164	251	523	774	376	587	383	717
Ohio	2,307	547	1,620	2,167	2,224	1,735	325	844
Oklahoma	3,838	2,123	2,336	4,459	2,558	3,814	433	1,480
Other States [3]	4,527	1,947	2,827	4,774	2,003	5,561	1,521	3,709
PAD District III	**83,037**	**10,799**	**24,600**	**35,399**	**31,972**	**38,704**	**20,896**	**6,541**
Alabama	2,218	267	365	632	702	753	809	521
Arkansas	1,487	104	149	253	138	652	86	679
Louisiana	23,413	2,132	6,291	8,423	9,422	13,916	7,272	1,407
Mississippi	3,925	617	1,788	2,405	1,670	2,259	613	962
New Mexico	867	201	183	384	721	488	350	473
Texas	51,127	7,478	15,824	23,302	19,319	20,636	11,766	2,499
PAD District IV	**4,334**	**2,595**	**1,932**	**4,527**	**4,353**	**4,378**	**1,189**	**4,722**
Colorado	731	324	366	690	557	583	217	576
Montana	1,248	700	494	1,194	1,481	1,221	217	1,687
Utah	1,330	511	414	925	1,021	1,055	259	409
Wyoming	1,025	1,060	658	1,718	1,294	1,519	496	2,050
PAD District V	**41,670**	**4,331**	**10,240**	**14,571**	**16,606**	**11,521**	**15,377**	**3,749**
Alaska	1,037	81	237	318	277	806	1,124	66
California	29,497	3,008	8,467	11,475	13,559	8,016	11,566	2,774
Washington	7,330	1,192	1,381	2,573	2,122	2,143	1,318	339
Other States [3]	3,806	50	155	205	648	556	1,369	570
U.S. Total	**176,404**	**31,251**	**65,697**	**96,948**	**79,162**	**99,955**	**56,287**	**31,363**

See footnotes at end of table.

Table 35. Working Storage Capacity [1] at Refineries and Gasoline Blending Plants by PAD District and State as of January 1, 1988 (Continued)
(Thousand Barrels)

District and State	Products							Total Crude Oil and Products
				Jet Fuel		All Other Products [2]	Total Products	
	Lubricants	Propane	Butane	Naphtha-type	Kerosene-type			
PAD District I	**2,947**	**2,019**	**1,492**	**662**	**4,895**	**16,597**	**93,392**	**117,056**
New Jersey	651	272	406	30	3,113	6,566	43,323	51,160
Pennsylvania	2,039	1,033	976	209	1,334	5,594	25,401	35,685
Other States [3]	257	714	110	423	448	4,437	24,668	30,211
PAD District II	**2,696**	**5,786**	**3,365**	**1,287**	**5,457**	**31,125**	**134,148**	**157,847**
Illinois	963	787	830	44	1,736	10,602	35,641	42,272
Indiana	570	346	757	378	1,017	2,250	17,457	19,987
Kansas	12	2,669	390	0	271	4,739	19,049	21,951
Kentucky	171	504	22	168	248	1,746	5,696	6,860
Ohio	200	455	439	90	539	2,291	11,309	13,616
Oklahoma	782	271	392	545	1,042	6,657	22,433	26,271
Other States [3]	0	754	535	62	604	2,840	22,363	26,890
PAD District III	**9,773**	**6,445**	**11,108**	**3,087**	**11,477**	**103,272**	**278,674**	**361,711**
Alabama	0	3	18	134	275	49	3,696	6,114
Arkansas	126	2	6	19	25	3	1,969	3,476
Louisiana	3,189	1,308	5,955	791	4,216	20,400	76,299	99,712
Mississippi	94	54	125	171	804	524	9,681	13,606
New Mexico	0	8	25	313	117	911	3,790	4,657
Texas	6,364	5,070	4,979	1,659	6,040	81,385	183,019	234,146
PAD District IV	**257**	**185**	**371**	**659**	**745**	**3,610**	**24,996**	**29,330**
Colorado	0	7	16	224	187	459	3,516	4,247
Montana	0	20	188	107	279	1,322	7,716	8,964
Utah	0	143	42	214	178	781	5,027	6,357
Wyoming	257	15	125	114	101	1,048	8,737	9,762
PAD District V	**1,861**	**511**	**1,643**	**1,578**	**5,959**	**34,849**	**108,225**	**149,895**
Alaska	0	5	19	152	459	245	3,471	4,508
California	1,861	337	1,336	1,071	3,782	30,837	86,614	116,111
Washington	0	150	214	137	1,220	3,184	13,400	20,730
Other States [3]	0	19	74	218	498	583	4,740	8,546
U.S. Total	**17,536**	**14,946**	**17,979**	**7,273**	**28,533**	**189,453**	**639,435**	[4] **815,839**

[1] Working Storage Capacity - the difference in volume between the maximum safe fill capacity and tank bottoms.

[2] All Other Products includes ethane, isobutane, pentanes plus, other hydrocarbons, hydrogen, alcohol, unfinished oils, finished aviation gasoline, special naphthas, wax, petroleum coke, still gas, petrochemical feedstocks and miscellaneous products.

[3] Other States include PAD District I: Connecticut, Delaware, Florida, Georgia, Maryland, New York, North Carolina, Virginia, West Virginia
PAD District II: Michigan, Minnesota, Missouri, North Dakota, Tennessee, Wisconsin
PAD District V: Hawaii, Nevada, Oregon.

[4] Includes 27,633 thousand barrels storage capacity at shutdown refineries and 32,821 thousand barrels storage capacity at gasoline blending plants.

Source: Form EIA-820, "Annual Refinery Report."

Table 36. Shell Storage Capacity [1] at Refineries and Gasoline Blending Plants by PAD District and State as of January 1, 1988
(Thousand Barrels)

District and State	Crude Oil	Products						
		Motor Gasoline			Gasoline Blending Components	Middle Distillates	Residual Fuel Oil	Asphalt and Road Oil
		Finished Leaded	Finished Unleaded	Total				
PAD District I	**27,665**	**3,696**	**14,511**	**18,207**	**12,255**	**22,491**	**13,452**	**5,277**
New Jersey	9,471	1,744	6,724	8,468	6,846	12,087	6,818	1,954
Pennsylvania	11,676	1,016	3,619	4,635	2,999	4,362	2,665	1,265
Other States [3]	6,518	936	4,168	5,104	2,410	6,042	3,969	2,058
PAD District II	**26,987**	**11,454**	**18,095**	**29,549**	**18,002**	**26,786**	**6,893**	**12,665**
Illinois	7,625	2,911	4,669	7,580	5,358	7,139	1,784	2,060
Indiana	2,940	908	2,303	3,211	3,140	3,561	1,600	2,382
[illegible]nsas	3,164	2,258	2,972	5,230	1,632	3,516	595	955
Kentucky	1,222	263	549	812	398	617	405	753
Ohio	2,637	639	1,872	2,511	2,573	1,923	422	906
Oklahoma	4,384	2,357	2,554	4,911	2,688	4,131	469	1,657
Other States [3]	5,015	2,118	3,176	5,294	2,213	5,899	1,618	3,952
PAD District III	**107,322**	**12,477**	**28,306**	**40,783**	**36,972**	**43,841**	**23,657**	**7,466**
Alabama	2,549	304	408	712	762	871	945	662
Arkansas	1,646	116	166	282	148	704	97	751
Louisiana	28,108	2,526	7,519	10,045	11,614	16,374	8,176	1,706
Mississippi	4,394	689	1,968	2,657	1,775	2,428	665	1,118
New Mexico	973	238	230	468	790	580	419	483
Texas	69,652	8,604	18,015	26,619	21,883	22,884	13,355	2,746
PAD District IV	**4,880**	**2,893**	**2,168**	**5,061**	**4,828**	**4,670**	**1,279**	**5,010**
Colorado	883	353	401	754	609	612	237	593
Montana	1,444	788	561	1,349	1,650	1,300	235	1,810
Utah	1,462	590	485	1,075	1,151	1,126	283	442
Wyoming	1,091	1,162	721	1,883	1,418	1,632	524	2,165
PAD District V	**48,201**	**5,030**	**11,831**	**16,861**	**19,016**	**12,934**	**16,979**	**4,007**
Alaska	1,103	86	251	337	291	847	1,173	69
California	34,643	3,585	9,857	13,442	15,617	9,152	12,932	2,988
Washington	8,318	1,304	1,555	2,859	2,417	2,342	1,436	351
Other States [3]	4,137	55	168	223	691	593	1,438	599
U.S. Total	**215,055**	**35,550**	**74,911**	**110,461**	**91,073**	**110,722**	**62,260**	**34,425**

See footnotes at end of table.

Table 36. Shell Storage Capacity [1] at Refineries and Gasoline Blending Plants by PAD District and State as of January 1, 1988 (Continued)
(Thousand Barrels)

District and State	Products							Total Crude Oil and Products
				Jet Fuel		All Other Products [2]	Total Products	
	Lubricants	Propane	Butane	Naphtha-type	Kerosene-type			
PAD District I	**3,045**	**2,321**	**1,677**	**720**	**5,232**	**19,352**	**104,029**	**131,694**
New Jersey	686	316	491	37	3,307	7,720	43,730	58,201
Pennsylvania	2,073	1,186	1,062	236	1,460	6,217	28,160	39,836
Other States [3]	286	819	124	447	465	5,415	27,139	33,657
PAD District II	**2,907**	**6,126**	**3,696**	**1,434**	**6,046**	**34,323**	**148,427**	**175,414**
Illinois	996	841	880	50	1,924	11,802	40,414	48,039
Indiana	630	357	786	437	1,156	2,566	19,826	22,766
Kansas	12	2,673	501	0	286	5,141	20,541	23,705
Kentucky	180	529	23	176	260	1,754	5,907	7,129
Ohio	220	498	473	97	591	2,672	12,886	15,523
Oklahoma	869	306	421	601	1,170	7,389	24,612	28,996
Other States [3]	0	922	612	73	659	2,999	24,241	29,256
PAD District III	**10,957**	**7,762**	**12,067**	**3,586**	**13,298**	**118,358**	**318,747**	**426,069**
Alabama	0	4	21	161	325	51	4,514	7,063
Arkansas	138	2	7	20	30	3	2,182	3,828
Louisiana	3,638	1,328	6,179	903	4,876	24,233	89,072	117,180
Mississippi	111	57	127	196	905	573	10,612	15,006
New Mexico	0	8	26	355	131	1,054	4,314	5,287
Texas	7,070	6,363	5,707	1,951	7,031	92,444	208,053	277,705
PAD District IV	**285**	**204**	**399**	**735**	**855**	**3,942**	**27,268**	**32,148**
Colorado	0	8	17	237	237	488	3,792	4,675
Montana	0	22	201	126	306	1,403	8,402	9,846
Utah	0	159	52	250	204	862	5,604	7,066
Wyoming	285	15	129	122	108	1,189	9,470	10,561
PAD District V	**2,012**	**561**	**1,811**	**1,749**	**6,741**	**39,915**	**122,586**	**170,787**
Alaska	0	5	20	161	489	256	3,648	4,751
California	2,012	354	1,474	1,221	4,377	35,219	98,788	133,431
Washington	0	178	230	141	1,352	3,813	15,119	23,437
Other States [3]	0	24	87	226	523	627	5,031	9,168
U.S. Total	**19,206**	**16,974**	**19,650**	**8,224**	**32,172**	**215,890**	**721,057**	**[4] 936,112**

[1] Shell Storage Capacity - the design capacity of the tank.

[2] All Other Products includes ethane, isobutane, pentanes plus, other hydrocarbons, hydrogen, alcohol, unfinished oils, finished aviation gasoline, special naphthas, wax, petroleum coke, still gas, petrochemical feedstocks and miscellaneous products.

[3] Other States Include PAD District I: Connecticut, Delaware, Florida, Georgia, Maryland, New York, North Carolina, Virginia, West Virginia
PAD District II: Michigan, Minnesota, Missouri, North Dakota, Tennessee, Wisconsin
PAD District V: Hawaii, Nevada, Oregon.

[4] Includes 30,536 thousand barrels storage capacity at shutdown refineries and 34,492 thousand barrels storage capacity at gasoline blending plants.

Source: Form EIA-820, "Annual Refinery Report."

Table 37. Refinery Receipts of Crude Oil by Method of Transportation by PAD District, 1987
(Thousand Barrels)

Method	PAD Districts					United States
	I	II	III	IV	V	
Pipeline						
Domestic	6,412	730,682	1,009,447	119,729	353,098	2,219,368
Foreign	19,364	296,146	192,023	24,066	4,101	535,700
Tanker						
Domestic	23,878	0	122,030	0	463,015	608,923
Foreign	378,873	0	706,051	0	67,608	1,152,532
Barge						
Domestic	1,215	3,180	128,840	0	5,929	140,164
Foreign	16,400	285	7,148	0	1,026	24,859
Tank Cars						
Domestic	6,542	0	0	3	14,202	20,747
Foreign	0	0	0	0	0	0
Trucks						
Domestic	4,589	8,579	30,215	15,789	9,037	68,209
Foreign	0	0	0	0	0	0
Total						
Domestic	42,636	742,441	1,290,532	135,521	846,281	3,057,411
Foreign	414,637	296,431	905,222	24,066	72,735	1,713,091

Source: Form EIA-820, "Annual Refinery Report."

Table 38. Fuels Consumed at Refineries by PAD District, 1987
(Thousand Barrels, Except Where Noted)

Commodity	PAD Districts					United States
	I	II	III	IV	V	
Crude Oil	0	0	0	0	0	0
Distillate Fuel Oil	129	126	97	0	614	966
Residual Fuel Oil	4,192	4,183	1,152	872	2,361	12,760
Liquefied Petroleum Gases	264	2,328	661	501	4,267	8,021
Natural Gas (million cubic feet)	22,572	66,155	419,198	11,001	85,947	604,873
Still Gas	20,143	46,569	103,265	6,130	47,206	223,313
Marketable Petroleum Coke	0	0	27	163	917	1,107
Catalyst Petroleum Coke	10,805	16,345	33,590	2,165	12,031	74,936
Coal (thousand short tons)	186	40	0	0	0	226
Purchased Electricity (million kWh)	3,319	7,607	13,038	1,111	13,447	38,522
Purchased Steam (million pounds)	4,074	1,236	16,789	4	3,722	25,825
Hydrogen (million cubic feet)	0	0	28	0	0	28
Unfinished Oils	128	412	7	0	849	1,396
Other [1]	101	188	484	0	0	773

[1] Other includes special naphthas, asphalt and road oil, finished motor gasoline, wax, gasoline blending components, lubricants and kerosene.
Source: Form EIA-820, "Annual Refinery Report."

Table 39. Reactivated and Shutdown Refineries During 1987

PAD District/Refinery	Location	Total Atmospheric Crude Oil Distillation Capacity B/CD	Total Downstream Charge Capacity B/SD	Date of Last Operation	Date Operable	Date Shutdown
REACTIVATED						
PAD District III		**337,750**	**537,900**			
Donna Refinery Partners, Ltd.	Donna, TX.	4,750	0	7/82	9/87	--
GAMXX Energy Inc.	Theodore, AL.	27,000	10,000	3/83	6/87	--
Petro Source Resources, Inc.	Vicksburg, MS.	6,000	7,900	1/85	4/87	--
Trans America Refining Co.	Good Hope, LA.	300,000	520,000	12/82	11/87	--
Total Reactivated		**337,750**	**537,900**	--	--	--
SHUTDOWN						
PAD District I		**1,000**	**0**			
Virginia Oil & Refining Co., Inc.	Jonesville, VA.	1,000	0	8/87	--	12/87
PAD District II		**10,200**	**5,450**	--	--	--
Flying J. Petroleum, Inc.	Williston, ND.	4,600	5,450	8/84	--	12/87
Lakeside Refining Co.	Kalamazoo, MI.	5,600	0	9/85	--	12/87
PAD District III		**5,800**	**29,700**	--	--	--
Clark Oil & Refining Corp.	Mt. Airy, LA.	0	27,000	12/86	--	12/87
MacMillan Petroleum Co.	Norphlet, AR.	5,800	2,700	8/87	--	12/87
PAD District IV		**3,000**	**0**			
Silver Eagle Oil Co.	La Barge, WY.	3,000	0	10/82	--	12/87
PAD District V		**46,500**	**11,380**	--	--	--
Beacon Oil Co.	Hanford, CA.	17,300	11,380	11/87	--	12/87
Sabre Refining Inc.	Bakersfield, CA.	10,000	0	12/86	--	9/87
Western Oil & Refining	Long Beach, CA.	19,200	0	2/84	--	12/87
Total Shutdown		**66,500**	**46,530**	--	--	--

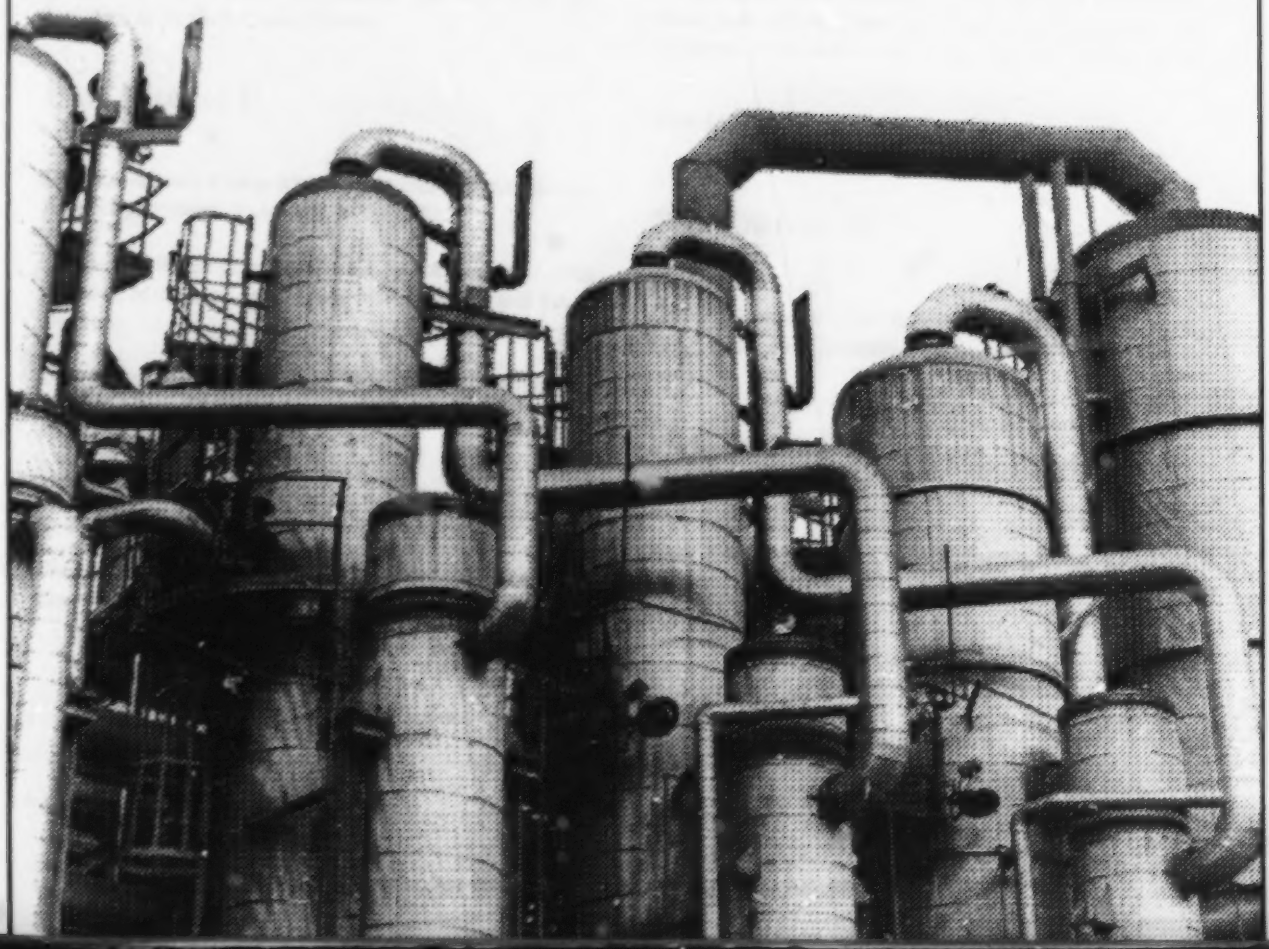
B/CD = Barrels per calendar day.
B/SD = Barrels per stream day.
Source: Form EIA-820, "Annual Refinery Report."

Table 40. Refinery Sales During 1987

Former Owner	Total Atmospheric Crude Oil Distillation Capacity B/CD	New Owner	Date of Sale
Asamera Oil (US) Inc. Colorado Refining Co. Commerce City, Colorado	33,500	Total Petroleum North America, Ltd.	6/87
Champlin Petroleum Co. Corpus Christi, Texas	155,200	Union Pacific Corp. (50%) Petroleos De Venezuela (50%)	4/87
Chevron Caribbean Gulf Refining Corp. San Juan, Puerto Rico	36,000	First Oil International Ltd.	8/87
Listo Petroleum Co. Donna, Texas	4,750	Donna Refinery Partners, Ltd.	5/87
Louisiana Oil & Refining Company of Egan Egan, Louisiana	5,000	OGC Corporation	10/87
Marion Corp. Theodore, Alabama	27,000	GAMXX Energy Inc.	4/87
Paramount Petroleum Corp. Bakersfield, California	20,500	Texaco Refining & Marketing	8/87
Quaker State Oil Refining Corp. St. Mary's, West Virginia	4,658	Mid-Atlantic Fuels	12/87
Vicksburg Refining Inc. Vicksburg, Mississippi	6,000	Petro Source Resources Inc.	3/87

B/CD = Barrels per calendar day.
Source: Form EIA-820, "Annual Refinery Report."

Appendices



Appendix A

District Descriptions and Maps

The following are the Refining Districts which make up the Petroleum Administration for Defense (PAD) Districts.

PAD District I

East Coast: District of Columbia and the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, and the following counties of the State of New York: Cayuga, Tompkins, Chemung, and all counties east and north thereof. Also the following counties in the State of Pennsylvania: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof.

Appalachian No. 1: The State of West Virginia and those parts of the States of Pennsylvania and New York not included in the East Coast District.

PAD District II

Indiana-Illinois-Kentucky: The States of Indiana, Illinois, Kentucky, Tennessee, Michigan, and Ohio.

Minnesota-Wisconsin-North and South Dakota: The States of Minnesota, Wisconsin, North Dakota, and South Dakota.

Oklahoma-Kansas-Missouri: The States of Oklahoma, Kansas, Missouri, Nebraska, and Iowa.

PAD District III

Texas Inland: The State of Texas except the Texas Gulf Coast District.

Texas Gulf Coast: The following counties of the State of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Patricio, Nueces, Kleberg, Kenedy, Willacy, and Cameron.

Louisiana Gulf Coast: The following Parishes of the State of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Saint Helena, Tangipahoa, Washington, and all Parishes south thereof. Also the following counties of the State of Mississippi: Pearl River, Stone, George, Hancock, Harrison, and Jackson. Also the following counties of the State of Alabama: Mobile and Baldwin.

North Louisiana-Arkansas: The State of Arkansas and those parts of the States of Louisiana, Mississippi, and Alabama not included in the Louisiana Gulf Coast District.

New Mexico: The State of New Mexico.

PAD District IV

Rocky Mountain: The States of Montana, Idaho, Wyoming, Utah, and Colorado.

PAD District V

West Coast: The States of Washington, Oregon, California, Nevada, Arizona, Alaska, and Hawaii.

Petroleum Administration for Defense (PAD) Districts

Refining Districts

Appendix B

Explanatory Notes

Note 1: Data Collection Methodology

Background

The Petroleum Supply Reporting System (PSRS) represents a family of data collection survey forms, data processing systems and publication systems that have been consolidated to achieve comparability and consistency throughout. The survey forms that comprise the PSRS are:

Form Number	*Name*
EIA-800	Weekly Refinery Report
EIA-801	Weekly Bulk Terminal Report
EIA-802	Weekly Product Pipeline Report
EIA-803	Weekly Crude Oil Stocks Report
EIA-804	Weekly Imports Report
EIA-810	Monthly Refinery Report
EIA-811	Monthly Bulk Terminal Report
EIA-812	Monthly Product Pipeline Report
EIA-813	Monthly Crude Oil Report
EIA-814	Monthly Imports Report
EIA-816	Monthly Natural Gas Liquids Report
EIA-817	Monthly Tanker and Barge Movement Report
EIA-820	Annual Refinery Report

Forms EIA-810 through 814, 816, and 817 comprise the Monthly Petroleum Supply Reporting System (MPSRS). These surveys collect detailed refinery and natural gas plant operations data; refinery, bulk terminal, natural gas plant, and pipeline stocks data; crude oil and petroleum product imports data; and data on movements of petroleum products and crude oil between Petroleum Administration for Defense (PAD) Districts. These surveys are the primary source of data for the "Summary Statistics" and "Detailed Statistics" sections of the *Petroleum Supply Annual* (PSA). A description of MPSRS survey forms follows in Explanatory Note 1.1.

Data are also obtained on magnetic tape from the Bureau of the Census on a monthly basis. These tapes contain aggregated import and export statistics that are used in the preparation of the PSA. A description of the Census data follows in Explanatory Note 1.2.

Note 1.1: Monthly Petroleum Supply Reporting System (MPSRS)

Background

The MPSRS was implemented in January 1983 as the result of an extensive effort to integrate the collection and processing of petroleum supply data that have been collected on other survey forms for many years. The collection of monthly petroleum supply statistics began as early as 1918 when the Bureau of Mines (BOM) began collecting data on refinery operations and crude oil stocks and movements. The collection systems were further expanded to include natural gas plant liquids production and storage in 1925, imports of crude oil and petroleum products and storage and movement of petroleum products in 1959, and tanker and barge movements of crude oil and petroleum products in 1964. Since their inception, each survey has undergone numerous changes, but the MPSRS is the first effort to make them all consistent and comparable.

Respondent Frame

EIA-810: All petroleum refineries and blending plants located in the 50 States, District of Columbia, Puerto Rico, the Virgin Islands, and Guam. Approximately 260 respondents report on the EIA-810.

EIA-811: Every bulk terminal operating in the 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. A bulk terminal is primarily used for storage and/or marketing of petroleum products and has a total bulk storage capacity of 50,000 barrels or more, and/or receives petroleum products by tanker, barge, or pipeline. Bulk terminal facilities associated with a product pipeline are included. Approximately 320 respondents report on the EIA-811.

EIA-812: All product pipeline companies that carry petroleum products (including interstate, intrastate, and intracompany pipelines) in the 50 States and the District of Columbia. Approximately 90 respondents report on the EIA-812.

EIA-813: All companies which carry or store 1,000 barrels or more of crude oil. Included in this survey are gathering and trunk pipeline companies (including interstate, intrastate, and intracompany pipelines), crude oil producers, terminal operators, storers of crude oil (except refineries), and companies transporting Alaskan crude oil by water in the 50 States and the District of Columbia. Approximately 180 respondents report on the EIA-813.

EIA-814: All companies, including subsidiary or affiliated companies, that import crude oil, unfinished oils, and finished petroleum products into the United States and Puerto Rico. Approximately 500 respondents report on the EIA-814.

EIA-816: All facilities that extract liquid hydrocarbons from a natural gas stream (natural gas processing plant) and/or separate a liquid hydrocarbon stream into its component products (fractionator). Approximately 1,000 respondents report on the EIA-816.

EIA-817: All companies that have custody of crude oil or petroleum products transported by tanker or barge between Petroleum Administration for Defense (PAD) Districts or between the Panama Canal and the United States. For purposes of this report, custody is defined as physical possession of crude oil or petroleum products on a company owned tanker or barge. Also, companies which lease vessels or contract for the movement of crude oil or petroleum products on a tanker or barge between PAD Districts or between the Panama Canal and the United States are considered to have custody. Approximately 50 respondents report on the EIA-817.

EIA utilizes a number of sources and methods to maintain the survey respondent lists. On a regular basis, survey managers review industry publications such as the *Oil and Gas Journal* and *Oil Daily* for information on facilities or companies starting up or closing down operations. These sources are augmented by articles in newspapers, letters from respondents indicating changes in status and information received from survey systems operated by other offices.

Every three years an extensive survey is conducted to completely refresh the frames. This involves consolidating information from every known source including State agencies, Federal agencies (e.g., EPA, Corps of Engineers, Census Bureau, etc.), and private industry directories. The effort also includes the evaluation of the impact of potential frame changes on the historical time series of data published from these respondents. The results of this frame study are usually implemented in January to provide a full year under the same frame.

Collection Methods

The data for all of the MPSRS surveys are collected monthly. Completed forms are required to be postmarked by the 20th calendar day following the end of the report month, with the exception of the EIA-814 which is due 15 work days following the end of the report month. Telephone follow-up calls are made to nonrespondents prior to the publication deadline for their data. An automated mailing list is maintained and is used to monitor receipt of the forms.

Imputing Missing Data

Imputation is performed for companies that do not respond to EIA Forms 810-813 and 816. For such companies, previous monthly values are used for current values. The previous month's ending stocks value is used for both the current month's beginning stocks and the current month's ending stocks. Data for nonrespondents on the EIA-814 and 817 are not imputed.

Response Rate

The response rate is generally 99 to 100 percent by the time the data are first published. Nonrespondents are contacted in writing and reminded of their requirement to report. Companies that file late or fail to file are subject to criminal fines, civil penalties, and other sanctions as provided by Section 13(i) of the FEA Act.

Note 1.2: Census Import (IM-145) and Export (EM-522 and EM-594) Data

Background

Each month the Energy Information Administration (EIA) purchases magnetic tapes of aggregated import and export statistics from the Bureau of the Census. These data tapes are the only source of export statistics and are used to augment the import data collected by the EIA.

Import Statistics (IM-145)

Coverage

Census import statistics used in the *Petroleum Supply Annual* (PSA) reflect both government and nongovernment imports of merchandise from foreign countries and U.S. possessions into the United States (the 50 States and the District of Columbia) without regard to whether or not a commercial transaction is involved. The following types of transactions are excluded from the statistics:

1. Merchandise in transit through the United States, when documented with Customs as an in transit movement.

2. U.S. merchandise that was held in foreign countries by the U.S. Armed Forces and is returned to the United States for the use of the Armed Forces.

Source of Import Information

The official U.S. import statistics are compiled by the Bureau of the Census from copies of the import entry and warehouse withdrawal forms that importers are required by law to file with Customs officials (Customs Forms 7501, 7505, and 7506).

Country and Area of Origin

The country reported in the statistics as the country of origin is defined as the country where the merchandise was grown, mined, or manufactured. In instances where the country of origin cannot be determined, the transactions are credited to the country of shipment.

Export Statistics (EM-522 and EM-594)

Census export statistics used in the PSA reflect both government and nongovernment exports of domestic and foreign merchandise from the United States (the 50 States and the District of Columbia) to foreign countries and U.S. possessions, without regard to whether or not the exportation involves a commercial transaction. The following types of transactions are excluded from the statistics:

1. Merchandise shipped in transit through the United States from one foreign country to another, when documented as such with U.S. Customs.

2. Bunker fuels and other supplies and equipment for use on departing vessels, planes, or other carriers engaged in foreign trade.

Source of Export Information

The official U.S. export statistics are compiled by the Bureau of the Census. Exporters are required to file export documents with Customs officials (Customs Form 7525).

Country and Area of Destination

The country of destination is defined as the country of ultimate destination or the country where the goods are to be consumed, further processed, or manufactured, as known to the shipper at the time of exportation. If the shipper does not know the country of ultimate destination, the shipment is credited to the last country to which the shipper knows that the merchandise will be shipped in the same form as it was when exported.

Note 2: Supply

The components of petroleum supply are field production, refinery production, imports, and stock withdrawal or addition:

Field Production is the sum of crude oil production (including lease condensate), natural gas processing plant production, and new supply (field production) of other liquids used by refineries.

Crude oil production is estimated based on data received from State conservation agencies. For further explanation, see Explanatory Note 3.

Field production of natural gas plant liquids (NGPL), including finished petroleum products, is reported monthly on survey Form EIA-816, *Monthly Natural Gas Liquids Report*. Negative production will occur when the amount of a product produced during the year is less than the amount of that same product that is reprocessed (input) or reclassified to become another product during the same year. For survey descriptions and other details, see Explanatory Note 1.1.

Refinery Production of petroleum products is reported monthly on survey Form EIA-810, *Monthly Refinery Report*. Published production of these products equals refinery production minus refinery input. Refinery production of unfinished oils and of motor and aviation gasoline blending components appears on a net basis under refinery input. Negative production will occur when the amount of a product produced during the year is less than the amount of that same product that is reprocessed (input) or reclassified to become another product during the same year.

Imports of crude oil and petroleum products are reported monthly on Form EIA-814, *Monthly Imports Report*. In addition, imports of natural gas liquids (NGLs) are obtained from the Census Bureau Tabulation IM-145. The Census Bureau Tabulation IM-145 summarizes import data from Customs import declarations reported on Customs Forms 7501, 7505, and 7506. Additional data taken from the IM-145 are relatively small quantities of naphtha-type and kerosene-type jet fuels, distillate fuel oils, and residual fuel oils withdrawn from bonded storage for use in international trade. Even though these duty-free fuels are stored on United States shores, they did not enter the United States for

domestic consumption and therefore are not included in the Form EIA-814 reporting system.

Stock Withdrawal (+) or Addition (-) is calculated by subtracting stocks at the end of the year from stocks at the beginning of the same year. (Note: The beginning stocks of one year are equal to the ending stocks of the previous year.) A positive result (+) would represent a withdrawal from stocks. A negative result (-) would represent a buildup of stocks. For a description of survey forms used to make stock withdrawal or addition calculations, see Explanatory Note 5.

Unaccounted-for Crude Oil is a balancing item that represents the difference between crude oil supply and disposition. Crude oil supply is the sum of field production, imports, and stock withdrawals. Crude oil disposition is the sum of exports, refinery input, losses, stock additions, and product supplied. Unaccounted-for crude oil is calculated by subtracting crude oil supply from crude oil disposition. A positive result indicates that refiners and exporters reported use of more crude oil than was reported to have been available to them. (This occurs, for example, when imports are undercounted due to late reporting or other problems.) A negative result would indicate that more crude oil was reported to have been supplied to refiners and exporters than they reported used.

Note 3: Domestic Crude Oil Production

Data for the Crude Oil Production System (COPS) are reported to the Department of Energy by State conservation agencies. Data on the volume of oil produced on Federally-owned offshore leases are reported by the Minerals Management Service, U.S. Department of the Interior.

EIA receives oil production data on a continuing basis from the reporting agencies. These data are updated periodically, and updates are provided to the EIA as they become available. The frequency with which these updates are reported depends on the revision policy of the various states. For example, in Texas (where revisions are made systematically) the preliminary oil production data report for the current month includes revisions to oil production data for the previous month. In Kansas (where revisions are made at irregular intervals) the revisions can include all months from the beginning of the year. Annual oil production data received for the *Petroleum Supply Annual* (PSA) from Alabama, Alaska, Arkansas, Florida, Nebraska, Texas, and Utah do not equal the sum of earlier preliminary monthly production volumes. Revised monthly production volumes consistent with the annual totals were not available for these states. The latest preliminary monthly oil production data for these states have been adjusted to agree with reported annual totals.

Note 4: Disposition

The components of petroleum disposition are crude oil losses, refinery inputs, exports, and products supplied for domestic consumption.

Crude Oil Losses is the sum of crude oil losses at refineries reported for all refineries on Form EIA-810, *Monthly Refinery Report*.

Refinery Inputs of crude oil, natural gas plant liquids, and other liquids are reported monthly on survey Form EIA-810, *Monthly Refinery Report*. Published inputs of unfinished oils and of motor and aviation gasoline blending components equal refinery input minus refinery output. Refinery inputs of finished petroleum products are reported on a net basis under refinery production.

Exports of crude oil and petroleum products are compiled from Census Bureau tabulations EM-522 and EM-594. Exports include crude oil shipments to Puerto Rico and theVirgin Islands, which are obtained from refinery receipts reported on Form EIA-810, *Monthly Refinery Report*, by refineries located in these places.

Product Supplied for each product is calculated by summing field production, plus refinery production, plus imports, plus stock withdrawal or minus stock addition, minus crude oil losses (plus net receipts when calculated on a Petroleum Administration for Defense (PAD) District basis), minus refinery input, minus exports. This formula ensures that total disposition equals total supply.

Product supplied indicates those quantities of petroleum products supplied for domestic consumption. Occasionally, the result for a product is negative because total disposition of the product exceeds total supply. Negative product supplied may occur for a number of reasons: (1) product reclassification has not been reported; (2) data were misreported or reported late; (3) in the case of calculations on a PAD District basis, the figure for net receipts was inaccurate because the coverage of interdistrict movements was incomplete; and (4) products such as gasoline blending components and unfinished oils have entered the primary supply channels with their production net having been reported, e.g., streams returned to refineries from petrochemical plants.

Product supplied for crude oil is the sum of crude oil burned on leases and by pipelines as fuel oil. These data are

reported on Form EIA-813, *Monthly Crude Oil Report*. Prior to January 1983, crude oil burned on leases and by pipelines as fuel oil were reported as either distillate or residual fuel oil and included in product supplied for these products.

Note 5: Stocks

Primary stocks of crude oil are the sum of ending stocks reported monthly on Form EIA-810, *Monthly Refinery Report*, and on Form EIA-813, *Monthly Crude Oil Report*. Crude oil held in the Strategic Petroleum Reserve is included unless otherwise noted. Alaskan crude oil in transit is also included. Primary stocks of petroleum products are summed from data reported on Form EIA-816, *Monthly Natural Gas Liquids Report*, Form EIA-810, *Monthly Refinery Report*, Form EIA-811, *Monthly Bulk Terminal Report*, and on Form EIA-812, *Monthly Product Pipeline Report*. Primary stocks of petroleum products do not include either secondary stocks held by dealers and jobbers or tertiary stocks held by consumers. For survey descriptions and other details, see Explanatory Note 1.1.

Note 6: Movements

Movements of crude oil between Petroleum Administration for Defense (PAD) Districts are reported on Form EIA-817, *Monthly Tanker and Barge Movement Report*, and on Form EIA-813, *Monthly Crude Oil Report*. Petroleum product movements are reported on Form EIA-817, *Monthly Tanker and Barge Movement Report*, and EIA-812, *Monthly Product Pipeline Report*. Net receipts is the difference between total movements into and total movements out of each PAD District by pipeline, tanker, and barge. For survey descriptions and other details, see Explanatory Note 1.1.

Note 7: Notes on Tables

Note 7.1 Crude Oil and Petroleum Products Overview statistics on the referenced line appear in Table 3 of the "Detailed Statistics," except where noted.

- Crude Oil and Petroleum Products Stock Withdrawal (+) or Addition (-), Petroleum Products Supplied, Total Imports, Crude Oil Imports, Total Exports, and Crude Oil Exports appear as labeled in Table 3. Total Production and Crude Oil Production appear under Field Production in Table 3.
- Natural Gas Plant Production is the sum of Natural Gas Liquids and Finished Petroleum Products Field Production in Table 3.
- Petroleum Products Imports is the sum of Natural Gas Liquids and Liquefied Refinery Gases (LRGs), Other Liquids, and Finished Petroleum Products Imports in Table 3.
- Total Crude Oil and Petroleum Products Ending Stocks appear in thousand barrels in Table 2.

Note 7.2 Crude Oil Supply and Disposition statistics on the referenced line appear in Table 1 of the "Detailed Statistics," except where noted.

- Total Domestic Field Production, Alaskan Field Production, Strategic Petroleum Reserve (SPR) Imports, Other Imports (synonymous with Gross Imports Excl. SPR), SPR and Other Primary Stocks Withdrawal (+) or Addition (-), Unaccounted for Crude Oil, Refinery Inputs, and Exports appear as labeled in Table 1.
- Crude Losses and Product Supplied appear as labeled in Table 3.
- SPR Ending Stocks and Other Primary Ending Stocks (synonymous with stocks excluding SPR) appear in thousand barrels in Table 1.
- Total Crude Oil Ending Stocks appear in thousand barrels in Table 2.
- Total Imports appear in Table 3.

Note 7.3 Finished Motor Gasoline Supply and Disposition statistics on the referenced line appear in Table 3 of the "Detailed Statistics," except where noted.

- Total Production is the sum of Field Production and Refinery Production in Table 3.
- Imports, Stock Withdrawal (+) or Addition (-), Exports, and Product Supplied appear as labeled in Table 3.
- Unleaded Percent of Total Product Supplied represents the ratio of finished unleaded motor gasoline product supplied to total finished motor gasoline product supplied, multiplied by 100 and rounded to the nearest tenth.
- Ending stocks are aggregated from ending stocks in thousand barrels in Table 2.

Note 7.4 Distillate and Residual Fuel Oil Supply and Disposition statistics on the referenced lines appear in Table 3 of the "Detailed Statistics," except where noted.

- Total Production is the sum of Field Production and Refinery Production in Table 3.
- Imports, Stock Withdrawal (+) or Addition (-), Exports, and Product Supplied appear as labeled in Table 3.
- Ending stocks appear in thousand barrels in Table 2.

Note 7.5 Liquefied Petroleum Gases Supply and Disposition statistics represent the aggregation of statistics on ethane, ethylene, propane, propylene, butane, butylene, and isobutane. The statistics on the referenced line appear in Table 3 of the "Detailed Statistics," except where noted.

- Total Production is the sum of Field Production and Refinery Production in Table 3.
- Imports, Stocks Withdrawal (+) or Addition (-), Refinery Inputs, Exports, and Product Supplied appear as labeled in Table 3.
- Ending stocks appear in thousand barrels in Table 2.

Note 7.6 Other Petroleum Products Supply and Disposition statistics represent the aggregation of statistics on pentanes plus, other liquids, and all finished petroleum products except finished motor gasoline, distillate fuel oil, residual fuel oil, and liquefied petroleum gases. The statistics on the referenced line are aggregated from Table 3 of the "Detailed Statistics," except where noted.

- Total production is the aggregated sum of Field Production and Refinery Production in Table 3.
- Imports, Stock Withdrawal (+) or Addition (-), Refinery Inputs, Exports, and Product Supplied are aggregated from Table 3.
- Ending stocks are aggregated from ending stocks in thousand barrels in Table 2.

Note 7.7 Table 1. U.S. Petroleum Balance

- Lines (1) through (3): Crude oil (including lease condensate) production for *Alaska*, and *Total U.S.* appear as labeled in Table 9. *Lower 48 States* are calculated by subtracting Alaska crude oil production from Total U.S. crude oil production.
- Line (5): *SPR Imports* are reported on survey Form EIA-814.
- Line (12): *Total Other Sources* equals crude oil stock withdrawal (+) or addition (-) plus unaccounted for crude oil minus crude oil losses minus crude oil product supplied in Table 2.
- Line (14): Natural Gas Plant Liquids (NGPL) *Field Production* equals field production of natural gas liquids (NGL) plus field production of finished petroleum products in Table 2.
- Line (15): NGPL *Net Imports* equals the sum of the imports of pentanes plus minus the exports of pentanes plus in Table 2.
- Line (16): NGPL *Stock Withdrawal (+) or Addition (-)* is equal to the stock withdrawal (+) or addition (-) of pentanes plus in Table 2.
- Line (17): *Total NGPL Supply* equals the sum of lines (14), (15), and (16).
- Line (18): Other Liquids *Stock Withdrawal (+) or Addition (-)* equals the aggregate stock withdrawal (+) or addition (-) for other hydrocarbons and alcohol, unfinished oils, motor gasoline blending components, and aviation gasoline blending components in Table 2.
- Line (20): *Other Hydrocarbons and Alcohol New Supply* equals the field production of same in Table 2.
- Line (21): *Refinery Processing Gain* is a balancing item equal to total refinery production minus total refinery input in Table 2.
- Line (23): *Total Other Liquids* equals the sum of lines (18) through (22).
- Line (24): *Total Production of Products* equals crude oil input to refineries plus field production of natural gas liquids and LRG and finished petroleum products; plus imports of pentanes plus; plus stock withdrawal (+) or addition (-) of pentanes plus; plus stock withdrawal (+) or addition (-) of other liquids; plus imports of other liquids; plus field production of other liquids; plus total refinery production; minus total refinery input; plus crude oil product supplied in Table 2.
- Line (25): *Gross Imports* of Refined Products equals imports of liquefied petroleum gases (LPG) plus imports of finished petroleum products in Table 2.
- Line (26): *Exports* of Refined Products equals exports of LPG plus exports of finished petroleum products in Table 2.

- Line (27): *Net Imports* of Refined Products equals the difference between lines (25) and (26).

- Line (28): *Total New Supply of Products* equals crude oil input to refineries plus field production of natural gas liquids and LRG and finished petroleum products; plus imports of pentanes plus; plus stock withdrawal (+) or addition (-) of pentanes plus; plus stock withdrawal (+) or addition (-) of other liquids; plus imports of other liquids; plus total field production of other liquids; plus total refinery production; minus total refinery input; minus crude oil product supplied plus imports of LPG and finished petroleum products; minus exports of LPG and finished petroleum products in Table 2.

- Line (29): *Refined Products Stock Withdrawal (+) or Addition (-)* equals the sum of stock withdrawal (+) or addition (-) for LPG and finished petroleum products in Table 2.

- Line (30): *Total Petroleum Products Supplied for Domestic Use* equals total products supplied in Table 2.

- Lines (31) through (34): Equals the respective products supplied in Table 2.

- Line (35): *Other Products Supplied* equals the sum of pentanes plus, aviation gasoline, naphtha-type jet fuel, kerosene-type jet fuel, naphtha <400 Deg. F. for petrochemical feedstock use, other oils >400 Deg. F. for petrochemical feedstock use, special naphthas, lubricants, waxes, petroleum coke, asphalt and road oil, still gas, unfinished oils, motor gasoline blending components, aviation gasoline blending components, and miscellaneous products supplied in Table 2.

- Line (37): *Total Product Supplied* is equal to total products supplied in Table 2.

- The sum of lines (38) and (39): Stocks of *Crude Oil and Lease Condensate (Excluding SPR)* and stocks held by the *Strategic Petroleum Reserve* equals ending stocks of crude oil in Table 2.

- Line (43): Stocks of *Finished Refined Products* equals the sum of liquefied petroleum gases and finished petroleum products stocks in Table 2.

Note 8: New Stock Basis

In January 1975, 1981, and 1983, numerous respondents were added to bulk terminal and pipeline surveys affecting subsequent stocks reported and stock withdrawal calculations. Using the expanded coverage (new basis), the end-of-year stocks, in million barrels, would have been:

- Crude Oil: 1982 - 645 (Total) and 351 (Other Primary).

- Crude Oil and Petroleum Products: 1974 - 1,121; 1980 - 1,425; and 1982 - 1,462.

- Motor Gasoline: 1974 - 225; 1980 - 263; 1982 - 244 (Total) and 203 (Finished).

- Distillate Fuel Oil: 1974 - 224; 1980 - 205; and 1982 - 186.

- Residual Fuel Oil: 1974 - 75; 1980 - 91; and 1982 - 68.

- Liquefied Petroleum Gases: 1974 - 113; 1980 - 128; and 1982 - 103.

- Other Petroleum Products: 1974 - 220; 1980 - 249; and 1982 - 259.

- Stock withdrawal calculations beginning in 1975, 1981, and 1983 were made using new basis stock levels.

In January 1984, changes were made in the reporting of natural gas liquids. As a result, unfractionated stream, which was formerly included in "Other Petroleum Products Supply and Disposition" table in the "Summary Statistics," is now reported on a component basis (ethane, propane, normal butane, isobutane, and pentanes plus). Most of these stocks will now appear in the "Liquefied Petroleum Gases Supply and Disposition" table of the "Summary Statistics." This change will affect stocks reported and stock withdrawals in each table. Under the new basis, end-of-year 1983 stocks, in million barrels, would have been:

- Liquefied Petroleum Gases: 1983 - 108.

- Other Petroleum Products: 1983 - 248.

Note 9: Stocks of Alaskan Crude Oil

Stocks of Alaskan crude oil in transit were included for the first time in January 1981. The major impact of this change is on the reporting of stock withdrawal calculations. Using the expanded coverage (new basis), 1980 end-of-year stocks, in million barrels, would have been 488 (Total) and 380 (Other Primary).

Note 10: 1981 Changes in Petroleum Industry Reporting

Petroleum statistics contained in this report for all years through 1980 were developed using definitions, concepts, reporting procedures, and aggregation methods that are consistent with those developed by the U.S. Bureau of Mines. Research conducted by the Energy Information Administration (EIA) in 1979 and 1980 indicated that changes had occurred in the petroleum industry that were not being adequately reflected in EIA's reporting system.

EIA reporting forms, definitions, and procedures were modified beginning in January 1981 to describe industry operations more accurately. Unfortunately, empirical information is not available to precisely measure the data shortcomings through 1980. However, estimates of the magnitudes of differences in the major data series are described below to form a basis for comparing 1979, 1980, and 1981 data.

Motor Gasoline

Prior to 1979, the EIA product-supplied series for motor gasoline was consistently about 2 percent lower than the Federal Highway Administration (FHWA) gasoline-sales data series, which is derived from State tax receipts. The difference increased to about 3 percent in 1979 and 1980. There were two primary causes for this growing difference. First, refinery operations, particularly the flows of unfinished oils and the redesignation of some finished products, were not being accurately described on the EIA survey forms. Second, a large amount of gasoline was being produced away from refineries at "downstream blending stations" to take advantage of provisions in regulations governing the amount of lead that could be added. These blending stations were not reporting gasoline production to the EIA until the data system was changed in January 1981.

Quantitative estimates of the magnitude of the difference in EIA's gasoline product supplied data in 1979 and 1980 have been made by the EIA and the American Petroleum Institute (API). Table B1 provides 1979 and 1980 data as published in the *Petroleum Statement, Annual*, as well as EIA and API estimates of "recast" motor gasoline product supplied.

EIA recast estimates were based upon preliminary monthly information in the *Monthly Petroleum Statement*. The ranges displayed in the EIA column reflect uncertainty in the estimates. Also shown are the FHWA motor gasoline sales statistics for those years.

Table B1. Finished Motor Gasoline Product Supplied
(Thousand Barrels per Day)

	EIA Reported	API Recast	EIA Recast	FHWA[1]
1979	7,034	7,302	7,183-7,347	7,258
1980	6,579	6,882	6,806-6,889	6,792

[1]FHWA gasoline statistics based on data from Federal Highway Administration, Estimate of Total Gasoline Use, Table MF-21A published October 1980 and September 1981. Aviation gasoline (Table MF-24) has been subtracted from FHWA product supplied quantities to make data comparable.

Distillate and Residual Fuel Oil

Distillate and residual fuel oil refinery production statistics through 1980 were adjusted to account for an imbalance between unfinished oil supply and disposition. The reported quantities of refinery inputs of unfinished oils typically exceed the available supply of unfinished oils. It has been assumed that this occurs when distillate and residual fuel oils produced by a refinery are shipped to another refinery, where it is treated as unfinished oil. This oil is then reprocessed rather than used or sold as distillate or residual fuel oil.

For many years (including 1980), the difference between unfinished oil disposition and supply was subtracted from distillate and residual fuel oil production to adjust for this discrepancy. Two-thirds of the difference was applied to distillate, and one-third to residual fuel oil.

Beginning in January 1981, this adjustment was discontinued because there was not sufficient empirical evidence to support it. Table B2 presents distillate and residual fuel oil refinery production in 1979 and 1980 as published (adjusted) and on the same basis as 1981 statistics (unadjusted) to permit comparison.

Adjusted distillate and residual fuel oil product supplied volumes differ from the unadjusted volumes by the same amounts as the adjusted and unadjusted production volumes.

Table B2. Distillate and Residual Fuel Oil Production and Product Supplied
(Thousand Barrels per Day)

	Adjusted Refinery Production	Unadjusted Refinery Production	Difference	Unadjusted Product Supplied
Distillate Fuel Oil				
1979	3,152	3,169	16	3,327
1980	2,661	2,764	103	2,969
Residual Fuel Oil				
1979	1,687	1,695	8	2,834
1980	1,580	1,634	54	2,562

Total Petroleum Products

The imbalance between the supply and disposition of unfinished oils and gasoline blending components is included with other products (line 35) in the U.S. Petroleum Balance (Table 1). These imbalances are reported as negative product supplied in the Other Liquids section, Supply and Disposition Statistics (Table 2). Since these changes only involve redistribution of the volumes of gasoline, distillate and residual fuel oil, gasoline blending components, and unfinished oils, the total volume of petroleum products supplied remains unaffected by them.

Note 11: Natural Gas Liquids Reporting Changes

Beginning in January 1984, a number of changes in the reporting of natural gas liquids (NGL) were implemented. The modified system reflects supply and disposition of NGL on a component, rather than product, basis.

From 1979 to 1983, the EIA collected and reported information on the supply and disposition of nine NGL products. Beginning with January 1984, NGL supply and disposition data were reported on a five component basis (see table below) to be consistent with record-keeping practices used by the industry. Table B3 shows the product categories under the new and old basis.

Four PSRS surveys were modified beginning in January 1984. They were:

EIA-810 *Monthly Refinery Report*
EIA-811 *Monthly Bulk Terminal Report*
EIA-812 *Monthly Product Pipeline Report*
EIA-816 *Monthly Natural Gas Liquids Report*

A fifth survey, the Form EIA-814, *Monthly Imports Report* (formerly Form ERA-60), was not modified. Adjustments

Table B3. Product Basis vs. Component Basis Reporting

	1984 Component Basis				
1979-1983 Product Basis	Ethane	Propane	Normal Butane	Isobutane	Pentanes Plus
Ethane	•				
Ethane-Propane Mixtures	•	•			
Propane		•			
Butane-Propane Mixtures		•	•		
Butane			•		
Isobutane				•	
Unfractionated Stream	•	•	•	•	•
Natural Gasoline and Isopentane					•
Plant Condensate					•

are applied to NGL imports data to make them consistent with the revised reporting system (See Explanatory Note 12).

Note 12: NGL Import/Export Algorithms

Beginning in January 1984, the Energy Information Administration (EIA) implemented changes in the reporting of natural gas liquids (NGL) supply data, moving from a nine-product slate basis to a five-component slate basis that corresponds to industry record-keeping practices. Changes could not be made to the import and export systems. Therefore, in order to allocate imports and exports of mixed NGL streams to individual component parts, the EIA developed a statistical algorithm.

Imports

The imports algorithm is based on information gathered from the larger importers of NGL, who were asked to provide component analysis of the products they imported during the first six months of 1983. The percentages shown in Table B4 are derived from the weighted averages of the data provided by the importers.

Exports

The export algorithm is based on information gathered from the larger exporters of NGL, who were asked to provide component analysis of the products they exported during 1983. The percentages shown in Table B4 are derived from the weighted averages of the data provided by the exporters.

It was necessary to derive percentages by Petroleum Administration for Defense (PAD) Districts of exportation, due to the wide variation of components included in the mixed streams.

Note 13: Statistical Notes

The universe of each of the Petroleum Supply surveys (refinery, bulk terminal, pipeline, crude oil stock, import, etc.,) is relatively small and ever-changing due to company births, deaths, mergers and splits. The frequency distributions of the petroleum supply variables are non-normal, highly variable, positive skewed and leptokurtic; that is, there are many small units and few large ones. Zeros often dominate the responses; that is, not all of the sampling units produce and/or store all products.

The statistics described in Table B5 were calculated from the monthly surveys over a 12-month period.

1. The number of active sampling units (respondents).

Table B4. Algorithm for Allocating NGL Imports/Exports (Percent)

	EIA Component Slate				
	Ethane	Propane	Normal Butane	Isobutane	Pentanes Plus
Import Product					
Natural Gasoline and Isopentane (EIA-814)	--	--	--	--	100
Plant Condensate (EIA-814)	--	--	--	--	100
Ethane (IM-145)	100	--	--	--	--
Propane (IM-145)	--	100	--	--	--
Butane (IM-145)	--	--	60	40	--
Butane-Propane Mixtures (IM-145)	--	40	35	20	5
Ethane-Propane Mixtures (IM-145)	80	20	--	--	--
Export Product					
Ethane (All PAD Districts)	100	--	--	--	--
Propane(All PAD Districts)	--	100	--	--	--
Butane (All PAD Districts)	--	--	100	--	--
Mixed Streams					
PAD Districts I, IV, V	--	40	60	--	--
PAD District II	30	25	15	15	15
PAD District III	--	80	20	--	--

Table B5. Descriptive Statistics for Selected Petroleum Supply Variables

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Refinery Gross Input to Atmospheric Crude Oil Distillation Units												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	183	185	186	187	188	189	190	188	187	187	186	188
Average	2,156	1,879	2,040	2,027	2,119	2,112	2,221	2,231	2,138	2,138	2,109	2,207
Stapdard Deviation	2,460	2,128	2,382	2,221	2,364	2,418	2,543	2,510	2,408	2,473	2,448	2,538
Refinery Crude Oil Input												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	182	183	184	186	186	188	190	187	186	186	184	186
Average	2,141	1,880	2,035	2,018	2,109	2,107	2,191	2,218	2,124	2,122	2,116	2,202
Standard Deviation	2,441	2,107	2,364	2,197	2,328	2,409	2,504	2,486	2,382	2,436	2,419	2,515
Refinery Finished Leaded Motor Gasoline Gross Production												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	158	160	162	159	164	167	162	161	161	161	156	152
Average	350	291	312	324	345	321	337	317	312	299	300	307
Standard Deviation	328	277	304	328	325	301	295	290	283	286	266	279
Refinery Finished Unleaded Motor Gasoline Gross Production												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	166	166	161	165	166	166	165	167	166	163	163	163
Average	928	799	956	940	973	971	1,005	991	956	982	990	1,053
Standard Deviation	1,046	888	1,108	1,123	1,143	1,124	1,141	1,125	1,123	1,164	1,144	1,186
Refinery Distillate Fuel Oil Gross Production												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	182	180	181	183	184	183	185	183	184	180	181	182
Average	481	413	423	431	439	452	463	470	458	493	516	562
Standard Deviation	585	490	485	483	476	495	511	518	506	542	572	642

Table B5. Descriptive Statistics for Selected Petroleum Supply Variables (Continued)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Refinery Residual Fuel Oil Gross Production												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	143	142	145	142	141	141	146	148	144	145	143	145
Average	208	173	195	188	192	193	201	195	200	203	214	228
Standard Deviation	292	268	317	310	272	257	280	287	287	291	308	331
Refinery Finished Leaded Motor Gasoline Stocks												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	168	169	168	167	169	168	168	167	167	167	164	158
Average	100	107	100	90	89	84	81	79	81	75	79	87
Standard Deviation	101	122	104	91	88	86	79	77	79	82	81	84
Bulk Terminal Finished Leaded Motor Gasoline Stocks												
Respondents	314	314	313	313	311	312	311	311	310	305	306	306
Nonzero Respondents	144	141	142	141	137	139	136	138	139	137	139	137
Average	256	242	227	211	206	204	200	202	199	190	198	196
Standard Deviation	530	500	469	453	427	435	409	418	406	386	412	402
Pipeline Finished Leaded Motor Gasoline Stocks												
Respondents	80	80	80	80	80	80	80	80	80	80	80	80
Nonzero Respondents	50	51	50	51	49	50	47	48	53	47	49	52
Average	342	322	320	286	293	263	294	267	260	277	265	242
Standard Deviation	541	498	516	420	432	395	442	387	392	410	429	379
Refinery Finished Unleaded Motor Gasoline Stocks												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	174	176	175	176	176	175	175	174	175	174	175	170
Average	216	213	224	224	203	208	210	196	203	195	206	219
Standard Deviation	307	278	337	335	259	290	294	235	294	298	244	275
Bulk Terminal Finished Unleaded Motor Gasoline Stocks												
Respondents	314	314	313	313	311	312	311	311	310	305	306	306
Nonzero Respondents	147	145	145	144	143	147	146	145	147	146	147	143
Average	432	417	424	422	424	410	399	418	420	401	408	414
Standard Deviation	974	920	962	930	964	957	935	974	989	968	970	941
Pipeline Finished Unleaded Motor Gasoline Stocks												
Respondents	80	80	80	80	80	80	80	80	80	80	80	80
Nonzero Respondents	52	55	53	54	54	54	53	54	53	53	52	54
Average	746	724	739	767	776	745	741	729	734	713	741	727
Standard Deviation	1,569	1,538	1,666	1,847	1,873	1,758	1,656	1,571	1,683	1,622	1,754	1,657
Refinery Distillate Fuel Oil Stocks												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	202	202	203	202	200	201	203	202	203	203	203	200
Average	193	183	154	155	157	169	180	189	190	173	186	204
Standard Deviation	277	249	184	187	186	219	246	257	256	231	249	274
Bulk Terminal Distillate Fuel Oil Stocks												
Respondents	314	314	313	313	311	312	311	311	310	305	306	306
Nonzero Respondents	231	231	228	226	223	223	222	225	225	226	223	224
Average	322	274	238	207	216	220	248	275	282	271	288	293
Standard Deviation	873	724	616	520	562	570	622	743	753	756	829	844
Pipeline Distillate Fuel Oil Stocks												
Respondents	80	80	80	80	80	80	80	80	80	80	80	80
Nonzero Respondents	52	55	53	52	54	55	54	56	54	56	55	55
Average	540	426	450	427	402	386	427	440	457	440	473	509
Standard Deviation	1,304	992	1,073	951	914	918	1,098	987	1,044	1,203	1,179	1,255
Refinery Residual Fuel Oil Stocks												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	172	171	172	171	169	168	169	166	166	167	166	163
Average	104	96	101	91	106	103	114	118	113	111	126	113
Standard Deviation	154	142	170	142	154	152	173	179	168	163	192	168
Bulk Terminal Residual Fuel Oil Stocks												
Respondents	314	314	313	313	311	312	311	311	310	305	306	306
Nonzero Respondents	71	73	72	71	71	71	70	71	70	69	67	65
Average	378	297	305	284	314	336	362	363	363	389	430	443
Standard Deviation	905	662	654	669	822	843	907	878	957	954	927	988
Refinery Crude Oil Stocks												
Respondents	247	245	245	246	246	247	247	247	247	247	248	248
Nonzero Respondents	188	188	188	187	185	186	186	186	186	185	186	185
Average	506	501	539	551	545	547	556	567	569	570	566	518
Standard Deviation	632	642	670	680	689	700	721	748	700	677	725	627
Pipeline/Tank Farm Crude Oil Stocks												
Respondents	156	157	157	156	156	158	158	158	158	158	157	157
Nonzero Respondents	120	121	120	120	121	123	122	123	123	122	121	121
Average	1,621	1,595	1,568	1,516	1,474	1,465	1,457	1,510	1,540	1,663	1,717	1,691
Standard Deviation	3,326	3,260	3,096	2,902	2,853	2,951	2,930	3,062	3,030	3,242	3,385	3,402

2. The number of sampling units reporting nonzero values (nonzero respondents).

3. The average of nonzero values reported in thousand barrels (average).

4. The standard deviation of nonzero values reported in thousand barrels (standard deviation).

Note 14: Addition of Crude Oil Pipeline Movements Data

Beginning in January 1985, inter-Petroleum Administration for Defense (PAD) District pipeline movements of crude oil were included in the crude oil supply balance at the PAD District level but did not affect National level statistics. As a result of including these movements, *Net Receipts* of crude oil and *Unaccounted for Crude Oil* at the PAD District level changed significantly. Also affected were crude oil imports and unfinished oil imports at the PAD District level which are provided by *PAD District of entry* (Tables 4-8) and by *PAD District of processing* (Table 14).

The tables in the *Petroleum Supply Annual* (PSA) that were changed due to the inclusion of inter-PAD District pipeline movements of crude oil are listed below.

- Tables 4-8, "PAD Districts I to V, Supply and Disposition of Crude Oil and Petroleum Products." *Net Receipts* includes movements by pipeline as well as tanker and barge.

- Table 20, "Movements of Crude Oil and Petroleum Products by Pipeline, Tanker, and Barge Between PAD Districts." The crude oil line includes movements by pipeline as well as by tanker and barge.

- Table 21, "Movements of Crude Oil and Petroleum Products by Pipeline Between PAD Districts." A line was added to report crude oil movements.

- Table 23, "Net Movements of Crude Oil and Petroleum Products by Pipeline, Tanker, and Barge Between PAD Districts." The crude oil line includes net movements by pipeline as well as by tanker and barge.

Note 15: 1986 Changes in Petroleum Industry Reporting

Beginning in January 1986, several changes to the Petroleum Supply Reporting System (PSRS) went into effect. These changes affected the frame of operators of petroleum facilities required to complete the monthly surveys in the PSRS and resulted in some changes to the tables presented in the *Petroleum Supply Annual* (PSA).

Changes in Survey Frames

As a result of frames maintenance activities, 39 respondents were added to the monthly survey frames. Table B6 shows the impact of the data reported by the new respondents on published data for production and stocks of major petroleum products.

Also, beginning in January 1986, a major integrated petroleum company consolidated production and stocks reporting for some of its facilities. Data previously reported separately on Form EIA-811, *Monthly Bulk Terminal Report*, and on Form EIA-816, *Monthly Natural Gas Liquids Report*, for two facilities, have been combined with data reported for two refineries on Form EIA-810, *Monthly Refinery Report*. The primary impact of this reporting change is on Table 18, "Stocks of Crude Oil and Petroleum

Table B6. Impact of New Respondents to December 1985 PSM Data

Product	Refinery Production (thousand barrels per day)		Stocks[1] (thousand barrels)	
	Reported by New Respondents	Published U.S. Total	Reported by New Respondents	Published U.S. Total
Leaded Gasoline	1.3	2,326	224	81,379
Unleaded Gasoline	0.6	4,323	276	108,422
Distillate Fuel Oil	0	3,174	1,217	143,911
Residual Fuel Oil	0	1,055	1,747	50,671
NGL's & LRG's	0	393	409	80,898
Other Products	0	3,302	1,413	239,158
Crude Oil (excl. SPR)	--	--	2,314	318,695

[1] Stocks as of December 31, 1985.

Products by PAD District," which will show a decrease in natural gas liquids (NGL) stocks at bulk terminals and natural gas processing plants, and an increase in NGL stocks at refineries.

Changes in Publication Tables

Several changes have been made to tables in the PSA either as a direct result of changes in reporting requirements or to improve the usefulness of the publication. These changes are:

- Table 11, "Refinery Input of Crude Oil and Petroleum Products by PAD District"

  - Alaskan crude oil receipts are now shown separately.

- Table 12, "Refinery Production of Petroleum Products by PAD District"

  - The "petrochemical feedstock use" and "other use" are no longer shown separately for still gas or for liquefied refinery gases.

- Table 14, "Imports of Crude Oil and Petroleum Products by PAD District"

  - Imports of unfinished oils are now separated into four categories: naphthas and lighter, kerosene and light gas oils, heavy gas oils, and residuum.

- Table 15, "Imports of Crude Oil and Petroleum Products by Source"
  - Countries formerly included in the categories "Other Western Hemisphere" and "Other Eastern Hemisphere" are shown individually.

- Table 18, "Stocks of Crude Oil and Petroleum Products by PAD District"

  - The breakout between "petrochemical feedstock use" and "other use" for each liquefied petroleum gas was eliminated.

Note 16: 1987 Changes in the Petroleum Supply Reporting System

Several changes to the Petroleum Supply Reporting System went into effect at the beginning of January 1987. These changes were made as part of the Energy Information Administration's (EIA's) continuing effort to provide pertinent, timely and consistent energy information.

Changes in Data Collection and Reporting Systems

- Fresh feed input to catalytic cracking units, hydrocracking units and cokers were added to the Form EIA-810, *Monthly Refinery Report.*

Changes in Publications

- The "Appalachian No. 2" Refining District has been combined with the "Indiana, Illinois, Kentucky," Refining District. This affects *Petroleum Supply Annual* (PSA) Tables 10, 11, 12, 13, 18, 24, and 25.

- Fresh feed inputs to catalytic cracking units, hydrocracking units and cokers are included in Table 11, "Refinery Input of Crude Oil and Petroleum Products by PAD District."

Clarification

In 1986, several refineries and terminals in the United States applied for Foreign Trade Zone (FTZ) status and applications from three refineries were approved. Consequently, during 1986, some refineries with FTZ status were treated as if they were within the United States while the Hawaiian FTZ was considered outside.

- Effective with the January 1987 data, all Foreign Trade Zone facilities located within the 50 United States are considered domestic entities and are included in statistics in the PSA. The prinicipal differences in the PSA data series are about a 1 percent increase in crude oil imports and a 3 percent decrease in product imports.

Note 17: EIA-820: Annual Refinery Report

Background

The Form EIA-820, *Annual Refinery Report*, is used to collect data measuring the preceding year's volume of fuels consumed for all purposes at the refinery; the preceding year's volume of refinery receipts of crude oil by method of transportation; current and next year projections for operable atmospheric crude oil distillation capacity, downstream charge capacity and production capacity; and current year working and shell storage capacity for crude oil and petroleum products at the refinery.

Refinery capacity data collection was begun in 1918 by the Bureau of Mines (BOM), then in the Department of Commerce, and was operated on a voluntary basis until 1980.

In 1980, the mandatory Energy Information Administration (EIA) Form EIA-177, *Capacity of Petroleum Refineries*, was implemented. Information on refining capacity was expanded to include not only current year operations but two year projections, and refinery input/production data were requested. Working storage capacity data was also added to the form and product categories were added for total coverage. Information on refinery downstream facilities was expanded to include a breakdown of thermal operations and to add vacuum distillation, catalytic hydrorefining and hydrotreating. Production capacity was also added to collect information on isomerization, alkylation, aromatics, asphalt, coking, lubes and hydrogen.

In 1983, the form was revised to improve the consistency and quality of the data collected by the EIA and redesignated as Form EIA-820, *Annual Refinery Report*. Two sections for data previously reported monthly were added to the annual: (1) refinery receipts of crude oil by method of transportation, and (2) fuels consumed for all purposes at refineries. Also, the second year projections were eliminated. As a result of a study conducted by the EIA evaluating motor gasoline data collected by the Federal Highway Administration (FHWA) and by the EIA, motor gasoline blending plants were included for the first time to the universe of respondents in order to produce more accurate statistics on the production of motor gasoline.

In 1987, the form was revised to reduce respondent burden and to better reflect current refinery operations through updated terminology. Information on projected input/production of refinery processing facilities was deleted. Several categories under catalytic hydrotreating were combined: naphtha and reformer feeds were combined into a single category as well as residual fuel oil and other. Thermal cracking types, gas oil and other were also combined into a single category. Catalytic reforming types, conventional and bi-metallic were replaced with low and high pressure processing units. Two new categories were added: fuels solvent deasphalting was added to downstream charge capacity and sulfur recovery was added to production capacity.

Description of Survey Universe

The reporting universe consists of all operating and idle petroleum refineries (including new refineries under construction), blending plants, shutdown refineries with usable storage capacity, and refineries shut down during the previous year, located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. As of January 1, 1988, there were 213 refineries and 26 motor gasoline blending plants located in the 50 States.

The list of respondents is maintained by monitoring the monthly Form EIA-810, *Monthly Refinery Report*, and industry publications for changes and developments in the petroleum industry such as refinery sales, mergers and new operations.

Information Collected

The main items of information collected annually are fuels consumed for all purposes at the refinery during the preceding year; refinery receipts of crude oil by method of transportation during the preceding year; current and next year projections for operable atmospheric crude oil distillation capacity, downstream charge capacity and production capacity; and current year working and shell storage capacity for crude oil and petroleum products at the refinery.

Collection Methods

The Form EIA-820 is sent to respondents during the month of December and completed forms are required to be postmarked by the 15th day of February of the current report year.

Receipt of the reports are monitored using an automated respondent mailing list. Telephone follow-up calls are made to secure responses from those companies failing to report by February 15th. Data are estimated and noncompliance procedures are implemented for those companies still not reporting data by closeout for the report year. Resubmissions are required whenever an error greater than five percent of the true value is discovered. In the event of a reporting error, company reports are updated after contact with the company and are followed-up by corrected report resubmissions.

Imputing Missing Data

The response rate for the Form EIA-820 is normally very high. For the January 1, 1988 survey, only three refineries failed to report, thereby requiring imputation. For nonrespondents, the following imputation methodology is applied:

Section 1: Fuel, Electricity, and Steam Consumed for All Purposes at Refineries

The estimates for this section are based upon data reported on the monthly Form EIA-810, *Monthly Refinery Report*, and the previous year's annual report. A ratio of the fuel use reported on the previous year's annual report to the fuel use and losses reported on the aggregated monthly data for the previous year is derived for each product category. To arrive at a fuels consumed quantity, this ratio is applied to the current monthly aggregated data for similar product categories (i.e., to arrive at 1987 fuels consumed data, a ratio of fuel use reported for 1986 on the annual report (1987

report) to fuel use and losses reported on the aggregated monthly data for 1986 is derived for each product category. This ratio is then applied to the 1987 aggregated monthly data for similar product categories).

Section 2: Refinery Receipts of Crude Oil by Method of Transportation

The estimates for this section are based on data reported on the monthly Form EIA-810, *Monthly Refinery Report*. The monthly data for 1987 are summed to arrive at a total for domestic and foreign receipts of crude oil. The method of transportation is taken from the previous year's annual report. The difference between the total receipts reported in 1987 and the total receipts reported on the annual report are distributed proportionately to the method of transportation categories.

Section 3: Operable and Storage Capacity as of January 1

Estimates for atmospheric crude oil distillation capacity in barrels per calendar day, are taken directly from the January 1988 Form EIA-810, *Monthly Refinery Report*. A barrels per stream day capacity is then derived by dividing the reported barrels per calendar day capacity by .95. Current year and projected year data for downstream charge capacity and production capacity are taken from the previous year's annual report. Estimates for working and shell storage capacity are taken directly from the previous year's annual report.

Note 17: Annual Refinery Report-Accuracy of the Data

There are two types of errors usually associated with data produced from a survey—sampling errors and nonsampling errors. Sampling errors are those errors that occur when survey estimates are based on a sample rather than being derived from a complete census of the frame. Nonsampling errors, sometimes referred to as biases, are those which can arise from a number of sources: (1) the inability to obtain data from all companies in the frame or sample (nonresponse) and the method used to account for nonresponses, (2) definitional difficulties and/or improperly worded questions which lead to different interpretations, (3) mistakes in recording or coding the data obtained from respondents, and (4) other errors of collection, response, coverage, and estimation. Because estimates from the Form EIA-820 survey are based on a complete census of the frame of petroleum refineries and motor gasoline blending plants, there is no sampling error in the data presented in this report. The data, however, are subject to nonsampling errors. Quality control procedures are employed in the collection and editing operations in an attempt to minimize misrepresentation and misreporting. Nonresponse follow-up procedures are employed to reduce the number of nonrespondents, and procedures employed to impute missing data, introduce a minimal amount of bias, given the relatively small volume of imputed data.

Note 18: Annual Refinery Report-Motor Gasoline Blending Plants

Most finished motor gasoline production occurs at petroleum refineries. However, some production takes place at blending facilities which mechanically blend gasoline components into finished motor gasoline. The following is a list of motor gasoline blending plants and their locations that operated during 1987 or reported on the Form EIA-820 for 1988.

Citgo Petroleum Corp.
Linden, New Jersey

Edgington Oil Co. Inc.
Signal Hill, California

Enron Gas Processing Inc.
Brooker, Florida

GATX Terminal Corp.
Pasadena, California

GATX Terminal Corp.
Carteret, New Jersey

Hartford/Woodriver Terminal
Hartford, Illinois

Intercontinental Terminal Co.
Deer Park, Texas

IOT Energy Corp.
St. Louis, Missouri

ITAPCO
New Albany, Indiana

Marion Petroleum Distributing
Ocala, Florida

Morgan Production Inc.
Karnack, Texas

New Haven Terminals Inc.
East Haven, Connecticut

Northville Industries Corp.
Linden, New Jersey

Northville Industries Corp.
Riverhead, New York

Northville Industries Corp.
Setauket, New York

Oiltanking of Texas Inc.
Houston, Texas

Petro-Diamond Terminal Co.
Long Beach, California

Phillips 66 Co.
Jefferson City, Missouri

Phillips 66 Co.
East Chicago, Indiana

Phillips 66 Co.
East St. Louis, Illinois

Phillips 66 Co.
Decatur, Illinois

Southland Oil Co.
Vicksburg, Mississippi

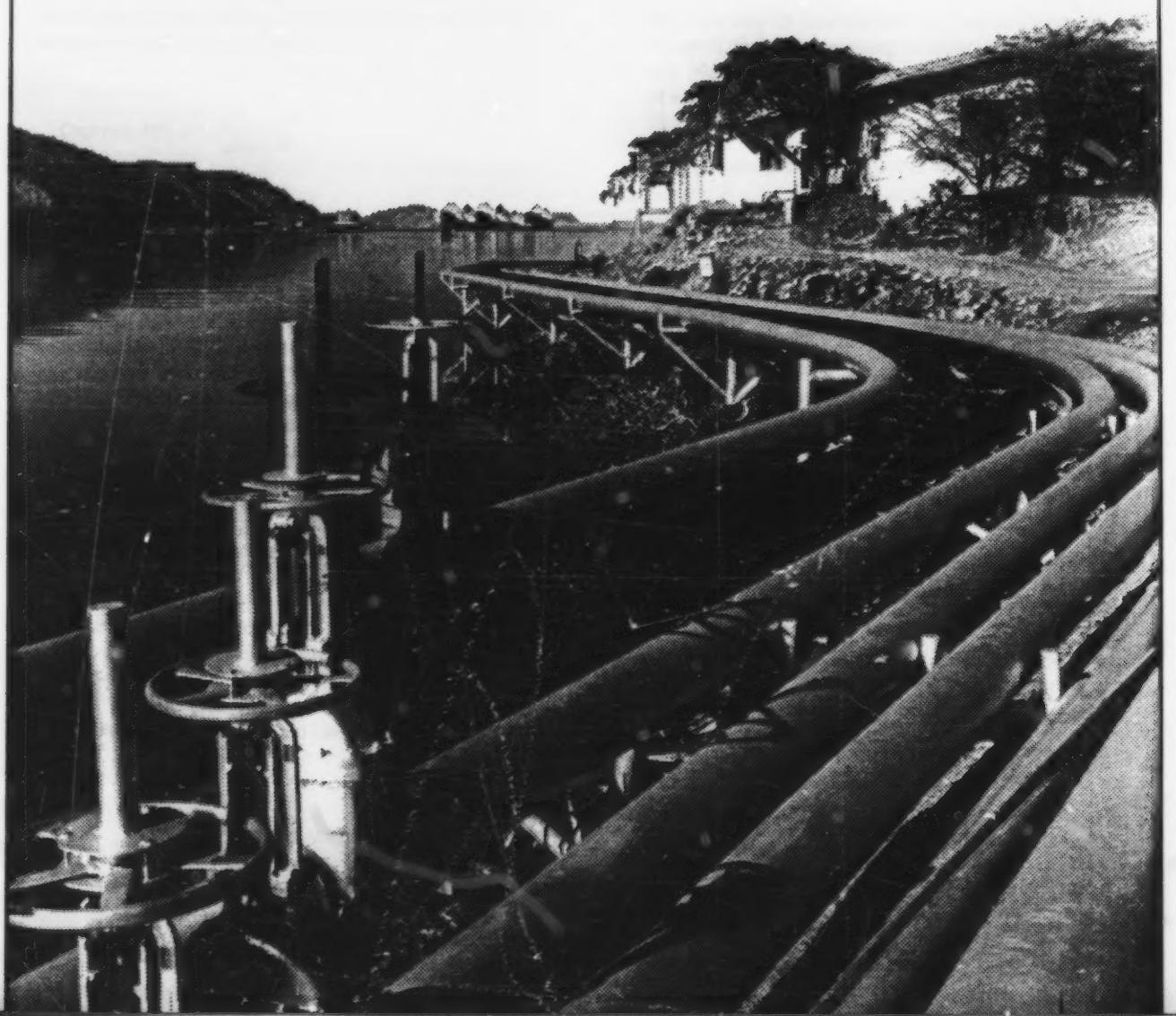
Spruce Oil
Denver, Colorado

Westec Petroleum Inc.
Grand Junction, Colorado

Westec Petroleum Inc.
Denver, Colorado

Wickland Oil Terminal Co.
Crockett, California

Glossary



Definitions of Petroleum Products and Other Terms

Alcohol. The family name of a group of organic chemical compounds composed of carbon, hydrogen, and oxygen. The series of molecules vary in chain length and are composed of a hydrocarbon plus a hydroxyl group; CH-(CH)n-OH (e.g., methanol, ethanol, and tertiary butyl alcohol (TBA)).

Alkylation. A refining process for chemically combining isobutane with olefin hydrocarbons (e.g., propylene, butylene) through the control of temperature and pressure in the presence of an acid catalyst, usually sulfuric acid or hydrofluoric acid. The product, alkylate, an isoparaffin, has high octane value and is blended with motor and aviation gasoline to improve the antiknock value of the fuel.

API Gravity. An arbitrary scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API; it may be calculated in terms of the following formula:

$$\text{Degrees API} = \frac{141.5}{sp.gr.60\,^{\circ}F/60\,^{\circ}F} - 131.5$$

Aromatics. Hydrocarbons characterized by unsaturated ring structures of carbon atoms. Commercial petroleum aromatics are benzene, toluene, and xylene (BTX).

Asphalt. A dark-brown-to-black cement-like material containing bitumens as the predominant constituents, obtained by petroleum processing. The definition includes crude asphalt as well as the following finished products: cements, fluxes, the asphalt content of emulsions (exclusive of water), and petroleum distillates blended with asphalt to make cutback asphalts. The conversion factor for asphalt is 5.5 barrels of 42 U.S. gallons per short ton.

ASTM. The acronym for the American Society for Testing and Materials.

Aviation Gasoline (Finished). All special grades of gasoline for use in aviation reciprocating engines, as given in ASTM Specification D910 and Military Specification MIL-G-5572. Excludes blending components which will be used in blending or compounding into finished aviation gasoline.

Aviation Gasoline Blending Components. Naphthas which will be used for blending or compounding into finished aviation gasoline (e.g., straight-run gasoline, alkylate, and reformate). Excludes oxygenates (alcohols, ethers), butane, and pentanes plus.

Barrel. A volumetric unit of measure for crude oil and petroleum products equivalent to 42 U.S. gallons. This measure is used in most statistical reports. Factors for converting petroleum coke, asphalt, still gas and wax to barrels are given in the definitions of these products.

Barrels Per Calendar Day. The maximum number of barrels of input that can be processed during a 24-hour period after making allowances for the following limitations:

the capability of downstream facilities to absorb the output of crude oil processing facilities of a given refinery. No reduction is made when a planned distribution of intermediate streams through other than downstream facilities is part of a refinery's normal operation;

the types and grades of inputs to be processed;

the types and grades of products expected to be manufactured;

the environmental constraints associated with refinery operations;

the reduction of capacity for scheduled downtime such as routine inspection, mechanical problems, maintenance, repairs, and turnaround; and

the reduction of capacity for unscheduled downtime such as mechanical problems, repairs, and slowdowns.

Barrels Per Stream Day. The amount a unit can process running at full capacity under optimal crude oil and product slate conditions.

Benzene. An aromatic hydrocarbon, (C6H6), present to a minor degree in most crude oils. Some important products manufactured from benzene are: styrene, phenol, nylon, aniline, and synthetic detergents.

Butane. A normally gaseous straight-chain or branch-chain hydrocarbon, (C4H10). It is extracted from natural gas or refinery gas streams. It includes isobutane and normal butane and is designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial butane.

> ***Isobutane.*** A normally gaseous branch-chain hydrocarbon, (C4H10). It is a colorless paraffinic gas that boils at a temperature of 10.9 degrees F. It is extracted from natural gas or refinery gas streams.
>
> ***Normal Butane.*** A normally gaseous straight-chain hydrocarbon, (C4H10). It is a colorless paraffinic gas that boils at a temperature of 31.1 degrees F. It is extracted from natural gas or refinery gas streams.

Butylene. An olefinic hydrocarbon, (C4H8), recovered from refinery processes.

Catalytic Cracking. The refining process of breaking down the larger, heavier, and more complex hydrocarbon molecules into simpler and lighter molecules. Catalytic cracking is accomplished by the use of a catalytic agent and is an effective process for increasing the yield of gasoline from crude oil. Catalytic cracking processes fresh feeds and recycled feeds.

> ***Fresh Feeds.*** Crude oil or petroleum distillates which are being fed to processing units for the first time.
>
> ***Recycled Feeds.*** Feeds that are continuously fed back for additional processing.

Catalytic Hydrocracking. A refining process that uses hydrogen and catalysts with relatively low temperatures and high pressures for converting middle boiling or residual material to high-octane gasoline, reformer charge stock, jet fuel and/or high grade fuel oil. The process uses one or more catalysts, depending upon product output, and can handle high sulfur feedstocks without prior desulfurization.

Catalytic Hydrotreating. A refining process for treating petroleum fractions from atmospheric or vacuum distillation units (e.g., naphthas, middle distillates, reformer feeds, residual fuel oil, and heavy gas oil) and other petroleum (e.g., cat cracked naphtha, coker naphtha, gas oil, etc.) in the presence of catalysts and substantial quantities of hydrogen. Hydrotreating includes desulfurization, removal of substances (e.g., nitrogen compounds) that deactivate catalysts, conversion of olefins to paraffins to reduce gum formation in gasoline, and other processes to upgrade the quality of the fractions.

Catalytic Reforming. A refining process using controlled heat and pressure with catalysts to rearrange certain hydrocarbon molecules, thereby converting paraffinic and naphthenic type hydrocarbons (e.g., low-octane gasoline boiling range fractions) into petrochemical feedstocks and higher octane stocks suitable for blending into finished gasoline. Catalytic reforming is reported in two categories. They are:

> ***Low Pressure.*** A processing unit operating at less than 225 pounds per square inch gauge (PSIG) measured at the outlet separator.
>
> ***High Pressure.*** A processing unit operating at either equal to or greater than 225 pounds per square inch gauge (PSIG) measured at the outlet separator.

Charge Capacity. The input (feed) capacity of the refinery processing facilities.

Coal. A generic term applied to carbonaceous rocks that were formed by the partial or complete decomposition of vegetation. These stratified carbonaceous rocks are either solid or brittle and are highly combustible. Includes lignite, bituminous coal, and anthracite which conform to ASTM Specification D388.

Crude Distillation. The refining process of separating crude oil components at atmospheric pressure by heating to temperatures of about 600 degrees F to 750 degrees F (depending on the nature of the crude oil and desired products) and subsequent condensing of the fractions by cooling.

Crude Oil (including Lease Condensate). A mixture of hydrocarbons that existed in liquid phase in underground reservoirs and remains liquid at atmospheric pressure after passing through surface-separating facilities. Included are lease condensate and liquid hydrocarbons produced from tar sands, gilsonite, and oil shale. Drip gases are also included, but topped crude oil (residual oil) and other unfinished oils are excluded. Liquids produced at natural gas processing plants and mixed with crude oil are likewise excluded where identifiable. Crude oil is considered as either domestic or foreign, according to the following:

> ***Domestic.*** Crude oil produced in the United States or from its "outer continental shelf" as defined in 43 USC 1331.
>
> ***Foreign.*** Crude oil produced outside the United States. Imported Athabasca hydrocarbons are included.

Delayed Coking. A process by which heavier crude oil fractions can be thermally decomposed under conditions of elevated temperatures and pressure to produce a mixture of lighter oils and petroleum coke. The light oils can be processed further in other refinery units to meet product specifications. The coke can be used either as a fuel or in other applications such as the manufacturing of steel or aluminum.

Distillate Fuel Oil. A general classification for one of the petroleum fractions produced in conventional distillation operations. It is used primarily for space heating, on-and-off-highway diesel engine fuel including railroad engine fuel and fuel for agricultural machinery), and electric power generation. Included are products known as No. 1, No. 2, and No. 4 fuel oils; No. 1, No. 2, and No. 4 diesel fuels.

No. 1 Fuel Oil . A light distillate fuel oil intended for use in vaporizing pot-type burners. ASTM Specification D396 specifies for this grade maximum distillation temperatures of 400 degrees F at the 10-percent recovery point and 550 degrees F at the 90-percent point, and kinematic viscosities between 1.4 and 2.2 centistokes at 100 degrees F.

No. 2 Fuel Oil. A distillate fuel oil for use in atomizing-type burners for domestic heating or for moderate capacity commercial-industrial burner units. ASTM Specification D396 designates minimum and maximum distillation temperatures at the 90-percent recovery point of 540 degrees F and 640 degrees F, and kinematic viscosities between 2.0 and 3.6 centistokes at 100 degrees F.

No. 1 and No. 2 Diesel Fuel Oils. Distillate fuel oils used in compression-ignition engines, as designated in the ASTM Specification D975:

No. 1-D. A volatile distillate fuel oil with a maximum distillation temperature of 550 degrees F at the 90-percent recovery point for use in high-speed diesel engines generally operated under variations in speed and load. Includes type C-B diesel fuel used for city buses and similar operations. Properties are defined in ASTM Specification D975.

No. 2-D. A gas oil type distillate of lower volatility with minimum and maximum distillation temperatures at the 90-percent recovery point of 540 and 640 degrees F for use in high-speed diesel engines generally operated under uniform speed and load conditions. Includes Type R-R diesel fuel used for railroad locomotive engines, and Type T-T for diesel-engine trucks. Properties are defined in ASTM Specification D975.

No. 4 Fuel Oil. A fuel oil for commercial burner installations not equipped with preheating facilities. It is used extensively in industrial plants. This grade is a blend of distillate fuel oil and residual fuel oil stocks that conforms to ASTM Specification D396 or Federal Specification VV-F-815C; with minimum and maximum kinematic viscosities between 5.8 and 26.4 centistokes at 100 degrees F. Also included is No. 4-D, a fuel oil for low and medium-speed diesel engines that conforms to ASTM Specification D975.

Eastern Hemisphere. That half of the earth east of the Atlantic Ocean which includes Europe, Asia, Africa and Australia. The Hawaiian Foreign Trade Zone is in this hemisphere.

Electricity (Purchased). Electricity purchased for refinery operations that is not produced within the refinery complex.

Ethane. A normally gaseous straight-chain hydrocarbon, (C2H6). It is a colorless paraffinic gas that boils at a temperature of -127.48 degrees F. It is extracted from natural gas and refinery gas streams.

Ether. A generic term applied to a group of organic chemical compounds composed of carbon, hydrogen, and oxygen, characterized by an oxygen atom attached to two carbon atoms (e.g., methyl tertiary butyl ether).

Ethylene. An olefinic hydrocarbon, (C2H4), recovered from refinery processes or petrochemical processes.

Field Production. Represents crude oil production on leases, natural gas liquids production at natural gas processing plants, and new supply of other hydrocarbons and alcohol.

Flexicoking. A thermal cracking process which converts heavy hydrocarbons such as crude oil, tar sands bitumen, and distillation residues into light hydrocarbons. Feedstocks can be any pumpable hydrocarbons including those containing high concentrations of sulfur and metals.

Fluid Coking. A thermal cracking process utilizing the fluidized-solids technique to remove carbon (coke) for continuous conversion of heavy, low-grade oils into lighter products.

Fuels Solvent Deasphalting. A refining process for removing asphalt compounds from petroleum fractions, such as reduced crude oil. The recovered stream from this process is used to produce fuel products.

Gas Oil. A liquid petroleum distillate having a viscosity between that of kerosene and lubricating oil. It derives its name from having originally been used in the manufacture of illuminating gas. It is now used to produce distillate fuel oils and gasoline.

Gasohol. See Motor Gasoline (Finished).

Gasoline Blending Components. Naphthas which will be used for blending or compounding into finished aviation or motor gasoline (e.g., straight-run gasoline, alkylate, and reformate). Excludes oxygenates (alcohols, ethers), butane, and pentanes plus.

Heavy Gas Oil. Petroleum distillates with an approximate boiling range from 651 degrees F to 1000 degrees F.

Hydrogen. The lightest of all gases, occurring chiefly in combination with oxygen in water; also in acids, bases, alcohols, petroleum, and other hydrocarbons.

Idle Capacity. The component of operable capacity that is not in operation and not under active repair, but capable of being placed in operation within 30 days; and capacity not in operation but under active repair that can be completed within 90 days.

Imported Crude Oil Burned As Fuel. The amount of foreign crude oil burned as a fuel oil, usually as residual fuel oil, without being processed as such. Imported crude oil burned as fuel includes lease condensate and liquid hydrocarbons produced from tar sand oil, gilsonite, and shale oil.

Isobutane. See Butane.

Isohexane. A saturated branch-chain hydrocarbon, (C6H14). It is a colorless liquid that boils at a temperature of 156.2 degrees F.

Isomerization. A refining process which alters the fundamental arrangement of atoms in the molecule without adding or removing anything from the original material. Used to convert normal butane into isobutane, (C4), an alkylation process feedstock, and normal pentane and hexane into isopentane, (C5), and isohexane, (C6), high-octane gasoline components.

Isopentane. See Natural Gasoline and Isopentane.

Kerosene. A petroleum distillate that has a maximum distillation temperature of 401 degrees F at the 10-percent recovery point, a final boiling point of 572 degrees F, and a minimum flash point of 100 degrees F. Included are the two grades designated in ASTM D3699: No. 1-K and No. 2-K, and all grades of kerosene called range or stove oil. Kerosene is used in space heaters, cook stoves, and water heaters and is suitable for use as an illuminant when burned in wick lamps.

Kerosene-type Jet Fuel. A quality kerosene product with a maximum distillation temperature of 400 degrees F at the 10-percent recovery point and a final maximum boiling point of 572 degrees F. The fuel is designated in ASTM Specification D1655 and Military Specification MIL-T-5624L (Grades JP-5 and JP-8). A relatively low-freezing point distillate of the kerosene type used primarily for commercial turbojet and turboprop aircraft engines.

Lease Condensate. A natural gas liquid recovered from gas well gas (associated and non-associated) in lease separators or natural gas field facilities. Lease condensate consists primarily of pentanes and heavier hydrocarbons.

Light Gas Oils. Liquid petroleum distillates heavier than naphtha, with an approximate boiling range from 401 degrees F to 650 degrees F.

Liquefied Petroleum Gases (LPG). Ethane, ethylene, propane, propylene, normal butane, butylene, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate raw natural gas plant liquids.

Liquefied Refinery Gases (LRG). Liquefied petroleum gases fractionated from refinery or still gases. Through compression and/or refrigeration, they are retained in the liquid state. The reported categories are ethane/ethylene, propane/propylene, normal butane/butylene, and isobutane. Excludes still gas.

Lubricating Oils. A substance used to reduce friction between bearing surfaces. Petroleum lubricants may be produced either from distillates or residues. Other substances may be added to impart or improve certain required properties. Do not include byproducts of lubricating oil refining such as aromatic extracts derived from solvent extraction or tars derived from deasphalting. "Lubricants" includes all grades of lubricating oils from spindle oil to cylinder oil and those used in greases. The three categories include:

Bright Stock. A refined, high viscosity lubricating oil base stock that is usually made from a residuum by a treatment such as deasphalting, acid treatment, or solvent extraction.

Neutral. A distillate lubricating oil base stock with a viscosity that is usually not above 550 Saybolt Universal

Seconds (SUS) at 100 degrees F. A product of hydrotreating, acid treatment, or solvent extraction.

Other. A lubricating oil base stock used in finished lubricating oils and greases, including black, coastal, and red oils.

Middle Distillates. A general classification that includes distillate fuel oil and kerosene.

Miscellaneous Products. Includes all finished products not classified elsewhere (e.g., petrolatum, lube refining byproducts (aromatic extracts and tars), absorption oils, ram-jet fuel, petroleum rocket fuels, synthetic natural gas feedstocks, speciality oils, and medicinal oils).

Motor Gasoline (Finished). A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, that have been blended to form a fuel suitable for use in spark-ignition engines. Motor gasoline, as given in ASTM Specification D439 or Federal Specification VV-G-1690B, include a range in distillation temperatures from 122 to 158 degrees F at the 10-percent recovery point and from 365 to 374 degrees F at the 90-percent recovery point. The Reid Vapor Pressure ranges from 9 to 15 psi. "Motor gasoline" includes finished leaded gasoline, finished unleaded gasoline, and gasohol. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

Finished Leaded Gasoline. Contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating. Includes leaded gasohol. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

Finished Unleaded Gasoline. Contains not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating. Includes unleaded gasohol. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

Gasohol. A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol but sometimes methanol), limited to 10 percent by volume of alcohol.

Motor Gasoline Blending Components. Naphthas which will be used for blending or compounding into finished motor gasoline (e.g. straight-run gasoline, alkylate, and reformate). Excludes oxygenates (alcohols, ethers), butane, and pentanes plus.

Naphtha. A generic term applied to a petroleum fraction with an approximate boiling range between 122 and 400 degrees F.

Naphtha-type Jet Fuel. A fuel in the heavy naphtha boiling range. ASTM Specification D1655 specifies for this fuel maximum distillation temperatures of 290 degrees F at the 20-percent recovery point and 470 degrees F at the 90-percent point, meeting Military Specification MIL-T-5624L (Grade JP-4). JP-4 is used for turbojet and turboprop aircraft engines, primarily by the military. Excludes ram-jet and petroleum rocket fuels.

Natural Gas. A mixture of hydrocarbons and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in underground reservoirs.

Natural Gas Field Facility. A field facility designed to process natural gas produced from more than one lease for the purpose of recovering condensate from a stream of natural gas; however, some field facilities are designed to recover propane, normal butane, pentanes plus, etc., and to control the quality of natural gas to be marketed.

Natural Gas Plant Liquids. Natural gas liquids recovered from natural gas in gas processing plants, and in some situations, from natural gas field facilities. Natural gas liquids extracted by fractionators are also included. These liquids are defined according to the published specifications of the Gas Processors Association and the American Society for Testing and Materials and are classified as follows: ethane, propane, normal butane, isobutane, pentanes plus, and other products from natural gas processing plants (i.e., products meeting the standards for finished petroleum products produced at natural gas processing plants, such as finished motor gasoline, finished aviation gasoline, special naphthas, kerosene, distillate fuel oil, and miscellaneous products).

Natural Gas Processing Plant. A gas processing plant is a facility designed (1) to achieve the recovery of natural gas liquids from the stream of natural gas which may or may not have been processed through lease separators and field facilities, and (2) to control the quality of the natural gas to be marketed. Cycling plants are classified as gas processing plants.

Natural Gasoline and Isopentane. A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas, that meets vapor pressure, end-point, and other specifications for natural gasoline set by the Gas Processors Association. Includes isopentane which is a saturated branch-chain hydrocarbon, (C5H12), obtained by fractionation of natural gasoline or isomerization of normal pentane.

Normal Butane. See Butane.

OPEC. The acronym for the Organization of Petroleum Exporting Countries, that have organized for the purpose of negotiating with oil companies on matters of oil production, prices and future concession rights. Current members are Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela.

Operable Capacity. The amount of capacity that, at the beginning of the period, is in operation; not in operation and not under active repair, but capable of being placed in operation within 30 days; or not in operation but under active repair that can be completed within 90 days. Operable capacity is the sum of the operating and idle capacity and is measured in barrels per calendar day or barrels per stream day.

Operating Capacity. The component of operable capacity that is in operation at the beginning of the period.

Other Hydrocarbons. Materials received by a refinery and consumed as a raw material. Includes hydrogen, coal tar derivatives, gilsonite, and natural gas received by the refinery for reforming into hydrogen. Natural gas to be used as fuel is excluded.

Oxygenates. Oxygenates include both alcohols and ethers used as octane boosting additives for gasoline (e.g., methyl tertiary butyl ether).

Pentanes Plus. A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

Petrochemical Feedstocks. Chemical feedstocks derived from petroleum principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics. The categories reported are "Naphtha-Less than 400 degrees F" and "Other oils over 400 degrees F."

> ***Naphtha-Less Than 400 Degrees F.*** A naphtha with a boiling range of less than 400 degrees F that is intended for use as a petrochemical feedstock.

> ***Other Oils-Over 400 Degrees F.*** Oils with a boiling range of over 400 degrees F that is intended for use as a petrochemical feedstock.

Petroleum Coke. A residue, the final product of the condensation process in cracking. This product is reported as marketable coke or catalyst coke. The conversion factor is 5 barrels of 42 U.S. gallons per short ton.

> ***Marketable Coke.*** Those grades of coke produced in delayed or fluid cokers which may be recovered as relatively pure carbon. This "green" coke may be sold as is or further purified by calcining.

> ***Catalyst Coke.*** In many catalytic operations (e.g., catalytic cracking) carbon is deposited on the catalyst, thus deactivating the catalyst. The catalyst is reactivated by burning off the carbon, which is used as a fuel in the refining process. This carbon or coke is not recoverable in a concentrated form.

Petroleum Products. Petroleum products are obtained from the processing of crude oil (including lease condensate), natural gas, and other hydrocarbon compounds. Petroleum products include unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products.

Plant Condensate. One of the natural gas liquids, mostly pentanes and heavier hydrocarbons, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants.

Primary Stocks. Stocks of crude oil or petroleum products held in storage at (or in) leases, refineries, natural gas processing plant pipelines, tankfarms, and bulk terminals that can store at least 50,000 barrels of petroleum products or that can receive petroleum products by tanker, barge, or pipeline. Crude oil that is in-transit by water from Alaska, or that is stored on Federal leases or in the Strategic Petroleum Reserve is included. Primary Stocks exclude stocks of foreign origin that are held in bonded warehouse storage.

Production Capacity. The amount of product that can be produced from processing facilities.

Propane. A normally gaseous straight-chain hydrocarbon, (C3H8). It is a colorless paraffinic gas that boils at a temperature of -43.67 degrees F. It is extracted from natural gas or refinery gas streams. It includes all products designated in ASTM Specification D1835 and Gas Processors

Association Specifications for commercial propane and HD-5 propane.

Propylene. An olefinic hydrocarbon, (C3H6), recovered from refinery processes or petrochemical processes.

Refinery. An installation that manufactures finished petroleum products from crude oil, unfinished oils, natural gas liquids, other hydrocarbons, and alcohol.

Residual Fuel Oil. The topped crude of refinery operations which includes No. 5 and No. 6 fuel oils as defined in ASTM Specification D396 and Federal Specification VV-F-815C, Navy Special fuel oil as defined in Military Specification MIL-F-859E including Amendment 2 (NATO Symbol F-77), and Bunker C fuel oil. Residual fuel oil is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes. Imports of residual fuel oil include "Imported Crude Oil Burned as Fuel."

Residuum. Residue from crude oil after distilling off all but the heaviest components, with a boiling range greater than 1000 degrees F.

Road Oil. Any heavy petroleum oil, including residual asphaltic oil used as a dust pallative and surface treatment on roads and highways. It is generally produced in six grades from 0, the most liquid, to 5, the most viscous.

Shell Storage Capacity. The design capacity of a petroleum storage tank and is always greater than or equal to working storage capacity.

Special Naphthas. All finished products within the naphtha boiling range that are used as paint thinners, cleaners, or solvents. These products are refined to a specified flash point. Special naphthas include all commercial hexane and cleaning solvents conforming to ASTM Specification D1836 and D484, respectively. Naphthas to be blended or marketed as motor gasoline or aviation gasoline, or that are to be used as petrochemical and synthetic natural gas (SNG) feedstocks are excluded.

Steam (Purchased). Steam, purchased for use by a refinery, that was not generated from within the refinery complex.

Still Gas (Refinery Gas). Any form or mixture of gases produced in refineries by distillation, cracking, reforming, and other processes. The principal constituents are methane, ethane, ethylene, normal butane, butylene, propane, propylene, etc. Still gas is used as a refinery fuel and a petrochemical feedstock. The conversion factor is 6.000 million BTU's per barrel (42 U.S. gallons).

Strategic Petroleum Reserve (SPR). Petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

Sulfur. A nonmetallic element of lemon-yellow color, sometimes known as "brimstone."

Thermal Cracking. A refining process in which heat and pressure are used to break down, rearrange, or combine hydrocarbon molecules. Thermal cracking includes gas oil, visbreaking, fluid coking, delayed coking, and other thermal cracking processes (e.g., flexicoking). See individual categories for definition.

Toluene. An aromatic hydrocarbon, (C6H5CH3), somewhat similar to benzene but of a higher boiling point produced in the coking of coal and also by petroleum refining processes. It is the basis of dyes, explosives, and aromatic compounds. Along with xylene, it is a key component in unleaded gasoline.

Unfinished Oils. Includes all oils requiring further processing, except those requiring only mechanical blending. Includes naphthas, kerosene, light and heavy gas oils, and residuum. See individual categories for definition.

Unfractionated Streams. Mixtures of unsegregated natural gas liquid components excluding those in plant condensate. This product is extracted from natural gas.

Vacuum Distillation. Distillation under reduced pressure (less the atmospheric) which lowers the boiling temperature of the liquid being distilled. This technique with its relatively low temperatures prevents cracking or decomposition of the charge stock.

Visbreaking. A thermal process in which heavy atmospheric or vacuum-still bottoms are cracked at moderate temperatures to increase production of distillate products and reduce viscosity of the distillation residues.

Wax. A solid or semi-solid material derived from petroleum distillates or residues by such treatments as chilling, precipitating with a solvent, or de-oiling. It is light-colored, more-or-less translucent crystalline mass, slightly greasy to the touch, consisting of a mixture of solid hydrocarbons in which the paraffin series predominates. Includes all marketable wax whether crude scale or fully refined. The three grades included are microcrystalline, crystalline-fully refined, and crystalline-other. The conversion factor is 280 pounds per 42 U.S. gallons per barrel.

> ***Microcrystalline Wax.*** Wax extracted from certain petroleum residues having a finer and less apparent

crystalline structure than paraffin wax and having the following physical characteristics: Penetration at 77 degrees F (D1321)-60 maximum. Viscosity at 210 degrees F in Saybolt Universal Seconds (SUS). (D88)-60 SUS (10.22 centistokes) minimum to 150 SUS (31.8 centistokes) maximum. Oil content (D721)-5 percent minimum.

Crystalline-Fully Refined Wax. A light-colored paraffin wax having the following characteristics: Viscosity at 210 degrees F (D88)-59.9 SUS (10.18 centistokes) maximum. Oil content (D721)-0.5 percent maximum. Other +20 color, Saybolt minimum.

Crystalline-Other Wax. A paraffin wax having the following characteristics: Viscosity at 210 degrees F (D88)-59.9 SUS (10.18 centistokes) maximum. Oil content (D721)-0.51 percent minimum to 15 percent maximum.

Western Hemishpere. That half of the earth that includes North and South America and adjacent islands.

Working Storage Capacity. The volume between the maximum safe fill capacity and the quantity below which pump suction is ineffective (bottoms).

Xylene. An aromatic hydrocarbon, (C6H4(CH3)2), produced in petroleum refining (cracking) processes. One important use is as a solvent in the manufacture of paints. Along with toluene, it is a key ingredient in unleaded gasoline.

THE PRESIDENT DOESN'T TAKE AN OATH TO DEFEND THE AMERICAN FLAG OR THE STATUE OF LIBERTY.

The President takes an oath to defend something even more important than a majestic symbol of our country.

The President takes an oath to defend the Constitution of the United States. A document that has been described as the greatest leap forward for freedom in human history. A document that is the foundation of our country. And the means by which we achieve the rule of law and protect our freedom.

As we commemorate the Bicentennial of the Constitution, there is no better way for you as an American to reaffirm the principles for which our country stands than to learn more about the Constitution.

The words we live by.

THE CONSTITUTION
The words we live by

To learn more about the Constitution write: Constitution, Washington, D.C. 20599. The Commission on the Bicentennial of The U.S. Constitution. Ad Council

Energy Information Administration
U.S. Department of Energy
Forrestal Building, EI-231
Washington, DC 20585

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

FIRST CLASS MAIL
POSTAGE AND FEES PAID
U.S. DEPT. OF ENERGY
PERMIT NO. G-20

FIRST CLASS MAIL